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John Durham Peters

THE CONTROL OF INFORMATION

THE CONTROL REVOLUTION: TECHNOLOGICAL AND ECONOMIC ORIGINS OF THE INFORMATION SOCIETY

by James R. Beniger

Cambridge: Harvard University Press, 1986. 493 pp., $25.00

This book is the brilliant execution of a flawed project: to justify the ways of information to men and women. This book is not only about control; it partakes of modern science's dreams of total order and control.

Though my criticisms of its methods and ambitions in the later sections of this essay will be sharp, I admire *The Control Revolution* very much as a piece of intellectual labor. This book is designed to be *the* synthetic work on the "Information Society" and its origins, and by all rights it will be. It is beautifully done and is built to last. The care, painstakingness, accounting for exceptions, and variety of sources make this work a paragon of the scholarly virtues. Especially refreshing is the frequent reliance on primary sources and classic texts in many different fields (how many who cite Adam Smith on "the invisible hand," for instance, supply the page reference to this phrase in *The Wealth of Nations*?). At times it attains an amazing concision of formulaton (ten words capture the neo-Darwinian synthesis in twentieth-century biology: "All life evolves by the differential survival of replicating entities" [p. 109]). Everything about the book is intelligent. It offers a seminal internal critique of the tradition of speculation about information, technology, and society.

The book's interventions in this tradition follow from its central

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thesis. *The Control Revolution* enlarges the conventional understanding of the "Information Society" both in terms of its history (which goes back to the industrial revolution) and its significance (which extends to the possible control of life itself). Opposed to the often breathless accounts of computers and their inauguration of social transformations of Aquarian scope, Professor Beniger takes the long view and demonstrates that it all started with industrialization. The industrial revolution, he argues, made it possible to "process" materials (e.g. coal, textiles, people), at unprecedented volumes and speeds. Such expansion and acceleration of the social-economic system precipitated a crisis in "control"—for instance, the many problems of scheduling and coordination in the early days of the railroad, which resulted often in missed connections or accidents. The titular "Control Revolution," child to the industrial revolution, arises in response to this crisis. The Control Revolution (this term, along with all other revolutions and "Information Society" is for some reason always capitalized in the text) is a watershed transformation in capacities of "information-processing," just as the industrial revolution was in material processing. "[T]he Control Revolution appears to be as important to the history of this century as the Industrial Revolution was to the last. Just as the Industrial Revolution marked an historical discontinuity in the ability to harness energy, the Control Revolution marks a similarly dramatic leap in our ability to exploit information" (p. 427). In a nutshell, Beniger shows that one should not seek the origins of the "Information Society" in the computer chip but in the steam engine. The computer represents only the latest, albeit crucial, version of a long line of "control technologies" that have emerged to satisfy an industrial(izing) society's need to control its increasingly fast and vast activities.

Professor Beniger's lengthening of historical horizon is a signal achievement. For one thing, it pulls the rug out from beneath much of the hype (a good deal of it corporately produced) about the earthshaking potential of the computer, which often makes it sound as if the 1980s were the pivot of history. More profoundly, he places the notion of the Information Society squarely within a logic of historical development. The Information Society is not characterized simply by the presence or absence of computers for him. Information, he shows, is an entity that becomes salient in a certain kind of society—a society of great speed, complexity, and size. Nonetheless, nagging difficulties remain about what intellectual profits are gained in so christening contemporary Western industrial societies (this renaming does yield other rather obvious kinds of profits, however, as we will discuss below).

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Much of the book is devoted to documenting the way in which the generalized "information-processing" capacities that constitute the Control Revolution developed in American economy and society from the early nineteenth century. The book provides a copious amount of information (what else?) on a stunningly various array of control technologies. The reader of this book will learn of the first appearance of law schools, automatic gum vending machines, secular symbols of Christmas, mass mailings, and myriad other forms of "programming and control."

Though Professor Beniger does not dwell on his logic of selection for historical evidence, the pattern of his examples suggests another achievement of this work: its refusal to reify technology. His examples again and again blur the line between the materially tangible and the more elusive products of human artifice: thus television sets and operations research are both technologies. The fact that one has tubes and wires and the other is an intellectual technology matters not. Both have an equally material existence (as he insists that all forms of programming do). His method counts thingliness, as it were, for nothing in the definition of technology. This resistance to reification allows him to find connections that have often been missed by those who cannot recognize technology without accompanying gadgetry or circuitry. For instance, he shows the affinity between bureaucracies and microprocessors: both were invented to manage operations that are beyond the capacities of a single individual (p. 185). Professor Beniger has demonstrated how fruitful a functional rather than formal conception of technology can be, and how many and strange are the connections that appear once you stop looking for technologies as concrete "things."

A final aspect of the book should be mentioned: its grand synthetic ambitions. The first of these is to be seen in its venture from bureaucracy into biology. The true meaning of the Control Revolution is far more than just the rearrangement of society; it is a transformation of "no less than the essential life function itself" (p. 36). Moreover, the Control Revolution is not just the reflection of a stage in the evolution of human history; it stems from "the heart of physical existence" (p. 58). Hence the Control Revolution has consequences for both life and society, biology and bureaucracy. For Beniger, the essence of all life is "programming and control." All life forms must exercise these functions if they are to resist, at least for a season, the siren-call of entropy. Life is ultimately an issue of information (pp. 106–118), in that it reproduces and evolves through the transmission of information en-

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coded in DNA. The secret of life, the secret of modern society, and the workings of computers all converge, thus, in information.

The blurring of natural control (DNA) and human control (bureaucracy and technology) is particularly evident in the third chapter, on the evolution of control. Here he draws a helical picture of the natural history of the planet. The first step in the evolution of control is the emergence of self-replicating molecules, which are intermediate between the inorganic universe and life (which in turn are distinguished, according to Beniger, by life's much greater complexity of organization). The first full control technology is DNA, which is shared by all living matter. The second is culture, i.e., programs that are learned—a stage of control shared by many members of the animal kingdom and all humans. The third stage in this evolution is bureaucracy, which as far as we know is restricted to humans, but has existed from the beginnings of recorded history. The final stage is technology, which is restricted to even fewer members of the human race. Beniger speculates of a possible final intermediate step between life and matter, though at a higher turn of the spiral: the synthesis of life itself through technologies of genetic engineering. His portrait of the evolution of control shows interlocked increases in the plasticity of programs, mobility of processors, restriction of access to control, and manipulation of control processes by human beings.

A second ambition has to do with the shape of the academy, more specifically, the nature of the social sciences. Professor Beninger believes that social science's tendency to produce spare parts for a machine that never gets built (p. 106) can be solved by making control, information, and communication the basis of a new machinery of social science. "The proper subject matter of the social and behavioral sciences . . . ought to be information: its generation, storage, processing, and communication to effect control" (p. 38). He advocates the reduction, in the special sense of that word, of all the chaotic knowledge of the social sciences to such concepts.

These ambitions are not shared by Beniger alone. In a sense, the dreams of synthetic life and unified science are central to the project of modern science since Descartes. Beniger's speculations on life and control give us a fascinating and in my view chilling picture of the late twentieth-century forms of this project, as we will explore at length below. As the first third of his book is the richest in theoretical substance, I will spend more time with it than with the later chapters, which consist largely of the marshalling of historical evidence.

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Information's Intellectual Imperialism

Professor Beniger is in the most fortunate position of being an author whose theory not only accounts for the distinctness of the modern world but is endorsed by the nature of the universe. How did he manage such a stunning rhetorical coup? He did so largely by exploiting what sometimes seems like everyone's favorite key-to-the-universe of late, "information." This term bears the aura of some of science's and technology's most proud achievements over the last century and a half—beginning with telegraphy, through thermodynamics, information theory, genetics, and of course, the computer. Just as the most powerful cognitive achievements of earlier eras have been seized upon by those who wished to extend their own projects,[1] so information today is the stimulus for a wide range of strange new hybrids: information societies, information minds, information life, information language, information scholarship. *The Control Revolution* is an excellent introduction, both in its arguments and execution, its style and its substance, to the wiley ways of information, that entity apparently intent on world domination.

At several points Beniger asks the central questions: why information, and why now? (pp. 31, 58, 426). Yet he eschews an historical answer to these questions: "No study of technological innovation or economic history can possibly answer such questions—no more than, say, the history of organic evolution could explain the importance of information to all living things. In both cases explanation lies not in the particulars of evolutionary or human history but in the nature of the physical universe" (p. 31). This is a classic example of the strategy of naturalization—imputing something invented by humans to the nature of the universe. In this section, I will ask Professor Beniger's question of why information now, but refuse his answers. To explain the currency of information—as a descriptor of society, economy, culture, mind, or life—we need not macrosociology but the sociology of knowledge; not the history of economies but the history of ideas. Information, along with its cousins communication and control, is not a discovery, but an invention. This is not to deny that it is a very powerful invention that explains a great deal (all great ideas, after all, are human products).[2] But it is to insist that information, as an intellectual phenomenon, has a history a good deal shorter than the more than three billion years posited by Beniger. Its origin is more likely to be found in the relations between knowledge and power in the postwar

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American university or in the dreams of modern science than in the primordial soup.

Why is information such a powerful concept today? For one thing, it enables one to disregard the specificity of levels or objects of analysis. Again and again one finds sentences in the *The Control Revolution* asserting the essential unity, for instance, between what an amoeba does and what an economy does—both are "concrete open processors" that process information to preserve their internal organization in the face of entropy. Information is the latest in a long line of concepts—geometry, grammar, thermodynamics, mathematical physics—which claimed to offer a unified theory of reality. It is a concept, in other words, that stimulates the scientific appetite for reductionism. For another thing, information is an intellectual technology well suited for smoothing out—for rationalizing—prickly problems of politics and culture. It accommodates definitions of life that do not exclude machines, and definitions of mind that do not exclude beasts. It presents images of consciousness and human life which are amenable to bureaucratic control. Finally, though information seems the latest incarnation of the Oversoul, it is a natural concept for a university system that has become increasingly cozy with the military-industrial-information complex since the second World War; it is the hired hand of bureaucratization and rationalization in intellectual life.

As a word, *information* acquired these all-encompassing senses only within the last century—during the height of the Control Revolution, of which it naturally is a product (as Beniger points out [p. 39]). Like many key words, its evolution saw a dramatic inversion of meaning. Its first English uses around the fifteenth century appear to have been conditioned by the reigning Aristotelian doctrine of the infusion of matter by form (hylomorphism). *Information* referred to the process by which a form (or idea or essence) entered into something material and gave it a specific shape or character, thus in-forming it. This sense survives today in the verb "to inform." When I say, for instance, that *The Control Revolution* is *informed* by the dream of science, I refer to the book's underlying structure, not to the information it "contains." With the decline of scholasticism and the rise of empiricism around the seventeenth century, *information* gradually came to refer to "the information of the senses" (such formulations being found in Bacon, Locke, Berkeley, and others): the process by which the world impresses itself on the senses. Gradually, the word lost the sense of being a process and came to mean simply the product—the pieces of knowledge or "impressions"—gathered.

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Once *informaton* referred to the indwelling of univerals; now it refers to the processing of particulars. *Information*'s meaning thus turned from north to south, from unities to units. The word's history is the story of modern intellectual history in miniature.[3]

The Cartesian Hubris

We cannot go deep into historical semantics here. The writings of Descartes, however, epitomize the shift from unities to units, and even more importantly for us, are a guide to the ambitions of modern science, which condition both information and *The Control Revolution*.

Descartes's dream, as a recent book title has it, is the world according to mathematics. "What characterizes the men of the generation of Descartes is above all the will to dominate, to control events, to eliminate chance and the irrational."[4] His task was to help the human race become the "lords and possessors of nature." Mathematics offered Descartes a dream of total order and control. Everything could, in principle, be mapped on a system of coordinates; every question could, in principle, be solved by quantification.

Descartes's craving for order can be seen in some most interesting observations he makes in the second discourse of his *Discourse on Method* (1637). He notes that things made by several designers are usually inferior to those made by a single designer. Thus old cities, which no one person set out to design, "are usually so badly proportioned in comparison with those orderly towns which an engineer designs at will on some plain that . . . one has the impression that they are more the product of chance than that of the human mind operating according to reason."[5] He praises the laws of Sparta and those of "true religion," since both were designed by a single author. As he surveys the state of knowledge in his day, he realizes that it is a mere hodge-podge of opinions generated by many people without any unifying plan. Though tearing down a city and rebuilding it purely for the sake of order is unheard of to Descartes (the innocence of the early seventeenth century!),[6] that is precisely what he plans to do with his own mind: rebuild it from scratch, solely according to reason. He is a kind of absolute monarch or despot of the kingdom of knowledge—who will redesign everything from the ground up in the name of reason and rationality.

The results of his venture in intellectual urban renewal are well known. He set out to doubt systematically everything he had ever

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learned or thought. His skepticism plowed through all the old buildings and crooked paths in his mental metropolis until it finally struck unmovable bedrock: the fact of his own doubting. He found that he could doubt this belief or that belief, but he could not doubt the fact that there was something doing the doubting. Hence his famous *cogito ergo sum*. The fact of his thinking—even if he was thinking about his own nonexistence—was not capable of being questioned. No one can deny the brilliance of Descartes's escape from skepticism. But what is striking for our purposes is the way it makes cognition the guarantor of existence. In thinking, one demonstrates one's existence. According to Descartes, his essence was a substance that thinks. Though the rationalization that Max Weber saw did not really gain institutional force until the bureaucratization of the late nineteenth century, here is a fine place to locate rationalization's intellectual emergence. The modern privilege of reasoning as the essence of human life—over feeling, acting, willing, suffering, believing, loving—is one part of the backdrop for the current imperialism of information, that most cognitive of entities, in all realms of life. *Cogito ergo sum* has become information *ergo* life: I process, therefore I am.

Descartes's conception of knowledge is also important for us. Whereas the priests who taught Descartes in his youth believed the world was animated by essences that could in-form both things and thoughts, Descartes sharply demarcated mind from matter. Mind was within, matter was without. What a mind experienced of matter—that is, of the external world—was "ideas": internal representations of external objects. Hence the pursuit of knowledge is risky, since knowledge is always in danger of being distorted by the received opinions of others or by the mind's urge to impose artificial order on the ideas that come to it. The true task of the mind is to be a mirror of nature, in Richard Rorty's famous phrase.[7] Science—that is, true knowledge—would emerge from coupling the discipline of reason to the inputs of ideas (what would today be called information).

For Descartes, the sciences would flourish once they left the old city of culture, history, and uncoordinated human creativity and designed a new city afresh. Descartes advocated what Bacon before him called "the legitimate humiliation of the human spirit"[8] in the name of knowledge. This bracketing of the creative human aspect of the production of knowledge served mainly to mystify the sources of science's own power. As Lewis Mumford points out, Descartes could say "I think, therefore I am" only because of a mass of buried human history—the evolution of the human species to consciousness and language, the de-

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velopment of philosophy, and so on.[9] Descartes clearly did not deny the human aspect of knowledge out of bad faith; it is more likely bad memory. Descartes bequeathed to modern science a repression of the role of *homo faber* in making knowledge (witness the shock that greeted Thomas Kuhn's rather commonsensical revelation that science is an historical, human enterprise).

A final aspect of Descartes's thought bears mentioning: his reduction of life to mechanism. The computer is for the twentieth what the clock was for the seventeenth and eighteenth centuries: the great metaphor under whose sign all things could be gathered.[10] Descartes saw animals as extremely complex machines or automata; humans were distinct from animals in that they alone had the use of reason, though their bodies were equally machines.

Four aspects of this narrative on Descartes are important for my critique of *The Control Revolution*. (1) Descartes's dream of total order to be achieved by razing or rebuilding chaotic structures resembles Beniger's desire to use concepts of control, information, and communication to organize the "proliferating" and "largely unsystematic knowledge" produced so far in the social sciences (p. 436). (2) Descartes's enthronement of thought as the most essential part of human existence resonates with Beniger's claim that "[i]nformation processing is also arguably the most human of life functions in that particular capabilities of our brains to process information best distinguish us from all other species" (p. 59). (3) Descartes's ignorance of the sources of his own insights is strikingly mirrored in Beniger's attempts to write a value-free, interpretation-free kind of history, his general lack of reflection on the effects and history of his own thinking, and his insistence that the popularity of information comes from the nature of life rather than the history of discourse. (4) Beniger inverts Descartes's mechanization of life. While Descartes said living things were machines, Beniger leaves the door open to the possibility that machines can achieve all the central life-functions—control, communication, and so on—and hence be practically indistinguishable from life.

Information: No Body's Knowledge

Information, then, is a concept with good connections. Not only is it the representative of some of our age's most striking cognitive achievements, it is central to the project of modern science. This project in Descartes's day served functions of human liberation and enlighten-

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ment; it was a noble dream. Today, however, it functions as an attack not, as is often maintained, on human uniqueness (which needs no metaphysical justification), but on the humanities (which are the embodiment of human achievements, science being one genre within them). When I speak of the humanities I am not concerned with undergraduate enrollments or university politics but with language and history, which Hannah Arendt somewhere said is all that the humanities are, and all that humanity has.

As Vico pointed out long ago in a counterpoint to Descartes, people use the things they know best in order to understand things that are novel or strange. The growth of knowledge consists, for Vico, in a reweaving of the total tapestry of human knowledge to take new phenomena into account. This reweaving is a matter of analogical or metaphorical thinking. Professor Beniger is one among many engaged in a massive reworking of the tapestry of human knowledge along lines of information. Information, to repeat, is an analogy, a construct of the human imagination, not a self-evident fact. *The Control Revolution* is a flight of an hypothesis: to see how much can be explained in terms of control, information, and communication. Beniger shows that it is indeed much. But most analogies have the tendency to forget their own conjectural status. Even information, a conceptual Proteus, cannot explain everything. It reveals some things well, and consigns others to outer darkness. Here I will be interested in what it is that gets forgotten by making information king over knowledge. At worst, the rewriting of human knowledge in terms of information is a clean-up operation of Cartesian scope, a clearing of the land of such rubbish as culture, history, experience, and even life in the interest of a more perfect order. The advance of concepts such as information and control into all realms of human knowledge may be only the latest stride in the march of rationalization and bureaucratization. *The Control Revolution* is itself a control technology.

To knock information back down to size, consider a few of its specific characteristics. First, it is granular. In both the statistical and popular senses, it comes in "bits." It is epistemological pointillism. There is no intertextuality or "grammar" to the stuff, as it most naturally comes in tables, lists, charts. One can no more weave stories out of it than one can weave a braid of sand. Second, it is perishable. Information is subject to decay. It is the most corruptible of all forms of knowledge, since any given piece of information can always be displaced by a more recent, accurate, or authoritative one. Third, it is, as Beniger points out (p. 34), epiphenomenal. It has no meaning or value

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in and of itself, only as it reflects the external world. It is always an image, an approximation, a derivation, a "mere," a phantasm in the mind's mirror. It has no real status; it is an illusion to be consumed and discarded. Nonetheless it has pretensions to being objective or substantial (as in those students who want to "get" "some" "information" "out of" a class rather than float in the clouds of theory). It dwells in the realms of quantity; it is knowledge reified—that is, thingified. Finally, information is a consumer commodity, much of it produced commercially. It is a scarce resource and like all scarce resources, is distributed in systematically asymmetrical ways.

Consider two cases of what the information metaphor explains badly: language and knowledge.

Like many others, Beniger treats language as principally a vehicle for transmitting or evoking information (pp. 84ff). Seeing language in terms of information makes language (like everything information touches) an engineering problem. "Communication" becomes the great solution, that is, people agreeing to use common signs and symbols to refer to the same "information." Thus you place human sociality within the realm of physics rather than politics; the essentially contestable nature of many of the topics of human discourse thus gets portrayed as an obstacle to be overcome by a consensus of signs or a smooth transmission of "information" rather than as a permanent feature of human society arising from differences of experience and power. The urge to engineer away the messiness of talk is an abiding one in the twentieth century; it accounts in part for the phenomenal diffusion and application of concepts from mathematical communication theory in the 1950s and 60s.

There is so much wrong with the conception of language as information processor that I don't know where to begin. Allow me simply to assert: language does; it does not transmit (or if it does, that is the least of its functions). With it humans cajole, wheedle, seduce, hate, politic, assert, perform, and of course, promise. It creates worlds, it is not only about the world "outside." As Beniger notes, many of its functions are ritual ones. But these are not merely "preprocessing," as he suggests, but the essence of human life. Play, poetry, drama, religion, love, politics all involve horribly uninformative, even anti-informative, uses of language. A conception of language as information processor denigrates the ways that language shapes and structures consciousness rather than just provides it with content. In his 1848 essay on the literature of power and the literature of knowledge, Thomas De Quincey wrote that *Paradise Lost* taught him nothing new, while most cook-

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books were highly informative. But which is better suited for informing (in the old sense) human consciousness? The concerns of *Paradise Lost*—sin, life, death, love, pride, punishment, and redemption—are all rather uninformative topics that fall through the cracks when one thinks of language as information. Information is simply an unfruitful way to use language to describe language.

Consider also what happens to knowledge when one accepts that information processing is the most human of functions and the natural calling of the human mind. Recall Socrates. His vocation was to show that what people took as sure knowledge was really only a cover for their ignorance. He was the wisest in the land, the oracle told him, because he knew his own ignorance, while everyone else labored under the delusion of their supposed knowledge. His philosophic gadflying was motivated by his insight into the productivity of ignorance: it was the midwife to true understanding. One could only really know something after having run up against the boundaries of knowledge. Information, in contrast, cannot recognize the productivity of ignorance: such is a mere lack of information. In the terms of information, the teaching of the ancient Greeks that knowledge begins in the recognition of one's ignorance or of the ancient Hebrews that knowledge begins in the recognition of one's own finitude, is a mere nullity, an absence, something it cannot account for. Experience, as Hans-George Gadamer, in the spirit of the Greeks, has argued, consists in learning through suffering, surprises, and mortality.[11] Human knowledge and experience have to do with the fact that we are mortal embodied beings, subject to fear and trembling, pride and paganism, living under the sentence of inevitable death. Information, however, is a form of knowledge divorced from the experience of mortality, suffering, or finitude. It is, as Beniger insists, common to all systems of control, from protozoa to the world economy. Nothing anchors it in the human body or human experience.

Information Society or Information State?

It is clearly no sport at all to point out that a set of analogies does not explain everything; but the problem is that informational analogies usually do not know they are analogies, or in Socrates's terms, do not know their own ignorance (that is precisely what they, as information, cannot know). Indeed, much of their appeal has to do with the way they make us forget the tenuous, fragile, afflicted, finite, loquacious,

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ignorant, negative character of our existence. Information fulfills the classical definition of hubris: it is a flight from finitude. As Beniger makes clear, the seedbed of information is bureaucracy, a form of life that surpasses the capacities of any individual. Who, or what, then, is the knower who knows information? The senses of a single individual are unable to monitor all the ongoings of a corporation or a state, but once the information has been gathered, one can partake of the bureaucratic gnosis of seeing what one could never have seen with one's own eyes. Information is a Faustian pact with the devil in which humanity trades its humanity for its ambitions to see everything at once. Information is the currency that secularized forms of omniscience—bureaucracy, the state, the computer—traffic in. To say that the most human of functions is information processing is to build a model of consciousness derived from the operations of the state. These analogies, culminating in the dream of the Information Society, fulfill Orwell's prescriptions for dystopia: human functions are defined in terms of those of the central bureaucracy. Yet the temptation to glorify information is great; everybody, perhaps, has a secret aspiration to godhood. The Information Society is clearly a splendid place to live if you happen to be a social scientist. Perhaps if we try hard enough, the zealous say, information will start to taste like ambrosia.

The notion of the Information Society clearly gets a lot of mileage out of its capacity to make people forget its status as a metaphor. It does not take too much cynicism to see how that concept adds a noble air to the potentially disturbing picture of increasing bureaucracy via the computer. It is a decidedly less ugly way to characterize a society than such unpleasant words as capitalist, imperialist, bureaucratic. It has the air of democracy and free access to all, conjuring such images as science, education, and knowledge. Moreover, it taps into the venerable American dream of redemption via technology.[12] Professor Beniger does not succumb to the boosterism of many who use this concept; in fact, his analysis could easily support an argument that the concept of Information Society is illegitimate.

But he does not take that step; why such a careful intellectual craftsman maintains a concept which he does not define theoretically is unclear. He seems uneasy with it, sometimes talking as if the Information Society were a *fait accompli,* other times talking as if it were just now emerging. He does make the familiar argument that an information society is one which has a large proportion of its work-force involved in information work, but he gives no reasons why the content of work should be definitive of an entire society. Nor does he address

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the criticism that such claims rest on so many liberalities of classification and definition as to make one's head spin—what do we learn by calling CEOs and telephone operators, professors and computer technicians, all information workers? What happens to the class, caste, gender, and power systems that structure the differences between the holders of those jobs? Will we soon be hearing of the Aztecs as a maize society? The Roman Empire as a cement (or slave) society? The Tang Dynasty as a rice society? Why should we characterize a society by its predominant product rather than by its general structure of social and economic relations? I don't see how information has made such categories as capital and class obsolete (Beniger hints that it does on p. 32). As long as discourse about information societies has no general theory of societies and of what it is that characterizes them, the claim that "we" live in an information society will remain a garland tossed to the inmates of a bureaucratized industrial capitalist social order.

Value-Free Information

Not surprisingly, then, topics which would call for a lamentation from some authors are treated without pause. "Each new technological innovation," he writes cheerfully, "extends the processes that sustain life" (p. 10; on p. 434 it becomes "human social life"), without worrying about the history of weaponry or the many examples of technology used to do away with life in the twentieth century. Saint-Simon's dictum that the modern world must move from "the government of men to the administration of things," which so often is taken as an epigram for one of modernity's central scandals, gives Beniger the occasion to explain how information-processing is enhanced when people are treated as things (p. 15). Nothing more is said. Control is not a dirty word; it is the essence of life for Beniger. Another striking feature is the systematic silence on the moral implications of the Control Revolution and of social control in general. The question of the access to control hardly appears. Typically he talks of how the Control Revolution has increased "our" ability to control events, without asking who the "we" in fact is. It seems that he regards the differential access to control to be as much an amoral fact as the differential survival of members of a species according to the viability of their various traits. Such he seems to treat as a fact of nature, not worthy of moral consideration. In short, Professor Beniger gives us a theory of control without a theory of power.

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This is not an attack on the ideal of value-free social science, nor a denial of the separation between explanation and evaluation. However, Beniger denies himself any reflection on moral implications, besides his suggestive epigraphs. Max Weber, architect of the fact-value split in social science, and a hero of this book for his early recognition of the Control Revolution, didn't find it inappropriate to climax his *Protestant Ethic and the Spirit of Capitalism* with a peroration on the cage which modern society is building for itself. Norbert Wiener, inventor of cybernetics and another seer of the Control Revolution (he called it "the second industrial revolution"), agonized on the moral implications of social control, and even went to speak with leaders of labor unions to warn them of the impending dangers automation posed to job security. Beniger's failure to explore moral implications may only indicate the inability of informational modes of discourse to deal with values.

The lack of any moral reflection, even by way of speculation or conclusion, is paralleled by the book's conception of history and history-writing. Peter Gay, in his *Style in History,* speaks of "intellectual voluptuaries" such as Macaulay and Burckhardt (surely a more recent example would be Foucault), who love the sensational, the dramatic, the good story.[13] Beniger's business-history mode would be the stylistic opposite. His style is hard to characterize: it is not exactly ascetic, but moderate, even, flat, devoid of metaphors, chary of superlatives, couched in moods of probability rather than certainty (even in his central assertions). It is a style of stylelessness. He has written a history of the Control Revolution in the intellectual mode it favors. His discourse not only praises information; it approximates it. The informational quality of his style is particularly evident in the abundant, well-designed tables, which remind one of the saying in social science that you should be able to get nothing from the prose that you can't get from the tables. For Beniger history is not an unfolding story, a revelation of human meaning, or a collection of ideal types, but a data set. Beniger writes a kind of list-history more concerned with trees than forest, facts than stories, innovations than structures. In short, Professor Beniger has achieved something remarkable: he has written a history following the canons and methods of empirical social science. This book treats the technological and economic history of nineteenth- and twentieth-century America as the data and the Control Revolution as an hypothesis to be tested. It denies the existence of the historical as an autonomous region of knowledge or logic. I do not think it a success *qua* history (how can you have history that suppresses narrative?), though

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it certainly is a fascinating experiment. Norbert Wiener in my view was right when he wrote in *Cybernetics* (1948) that despite the potential scientific breakthroughs in communication and control, we should leave much of social science to what he saw as the unscientific narrative methods of the historian.[14] Wiener saw the new sciences of information dwelling in community with the humanities; Beniger's text suggests a less harmonious relation, both in its style and its Cartesian project of tearing down the old city of the social sciences and rebuilding it on the new foundations of information, communication, and control. Beniger would seemingly give us a social science that includes all forms of life and technology but excludes culture and the humanities. His text is a parable of what history would look like if his dream of information came to pass.

Two Kinds of Order

Perhaps the fundamental question Professor Beniger sets out to answer (it is perhaps *the* fundamental question of all myth and science, at least in the Occident) is the problem of order. What are the sources of order? Why, if the universe is ruled by entropy, does social and cosmic order exist? For Beniger order is clearly an achievement. Order is what life wrests from entropy. Without a constant exertion of control, order will degrade. Order does not just happen. Further, in social matters, order for him is usually a *conscious* achievement.

Beniger thus favors a conception of order which sees it as a conscious, purposive, intentional activity. Like Descartes, he prefers the well-designed city on the plain to the labyrinthine cities that come to be without any central design or designer. His whole book is the story of the rise of centralized control and planning in modern societies, which he seems to find reflected in the nature of the universe. Though he says that the Control Revolution is based in the nature of life itself, it is of course no revolution from the point of view of life, which has been perpetuating itself for three billion years on this planet. It is revolutionary only for us. The implication is that *consciousness* of control is revolutionary, since it allows for possible manipulation of control (as in the synthesis of life).

So we come to something curious: it is only of late that the ordering of the world has come to consciousness, and yet Beniger takes consciously-controlled mechanisms of order as the paradigm of *all* order. He has conflated two different orders of order, in my view. One is the

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world-ordering activities that are done by beings who are conscious and reflective of their own activity as orderers. This order of order, call it conscious order, is to be found in the products of human artifice, most especially those that have a single designer. The other order of order, call it autonomic order, has long taken nature as its epitome, nature being that which produces itself, in Aristotle's terms. Autonomic order consists in the coherence and system that takes place without any consciousness of its ordering. The beating of my heart, my bone marrow's production of hemoglobin, the regulation of my endocrinological system are exquisite forms of order that my consciousness has little to do with. Neither does human consciousness in general have anything to do with designing or maintaining ecological interdependencies of the most intricate sorts. No one told the dung beetle to maintain order on the savanna.

Between these two is a battle zone: the order that emerges from the labors of many conscious beings without any central plan, the predominant type of order in society. Classical liberalism saw such order as autonomic—Adam Smith's invisible hand is the typical example. Centralized planning is anathema to classical liberals, for such is a corruption and interference and possible destruction of society's emergent order. This resistance to any ordering from central powers is exemplified well by William James's polemics against "classic" visions of the world—which want purity of line, elegance, and simplicity—and in favor of a "gothic" vision—which lets the order of the world emerge as it will, however grotesque, chaotic, overwrought, or bizarre it may seem.[15] James's social theory, like that of J. S. Mill before him, is based on an agnosticism in matters of social order, that is, a refusal to know the whole or to prescribe how it ought to work, since its designers are many.

Beniger, in contrast, wants to assimilate this liminal zone to conscious order. Moreover, even life itself will ideally be under the control of conscious order, as science cracks the code of DNA and starts to synthesize life (Mumford asks, however, Why bother?—unless it be to prove one's own godhood, since life already exists in so many forms on the planet). The evidence Beniger marshalls is convincing. Common sense, indeed, suggests that any society on the scale of most modern nation-states will need a good deal of centralized control.

And yet the problem remains: who controls, and moreover, who is the single designer that is to build the classic, conscious order of the world? These are not questions Professor Beniger raises; nor am I saying that he wants to be the one (science, rather, would be his likely

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candidate). Life has a much better record than does technology; I would rather keep its control out of the hands of grand designers. Moreover, I would keep the state out of the manipulation and control of life, though if one believes Beniger's account—or those of Marx, Weber, Mumford, or Foucault—such seems wishful thinking. One is left, perhaps, with either utopia or irony as the ways to resist the centralized control of life and society and to maintain a faith that gothic order is better. There is a little of both in the words of one of the great resisters, with which I end:

> I please myself with imagining a State at last which can afford to be just to all men [and women], and to treat the individual with respect as a neighbor; which even would not think it inconsistent with its own repose, if a few were to live aloof from it, not meddling with it, nor embraced by it, who fulfilled all the duties of neighbors and fellow-men. A State which bore this kind of fruit, and suffered it to drop off as fast as it ripened, would prepare the way for a still more perfect and glorious State, which also I have imagined, but not yet anywhere seen.[16]

NOTES

1. This use of current achievements to explain everything is explained well by Richard Rorty, *Philosophy and the Mirror of Nature* (Princeton: Princeton University Press, 1979), 366.
2. I attempt to develop this argument in a paper written with my colleague Eric Rothenbuhler, "The Reality of Construction," in *Perspectives in the Rhetoric of the Human Sciences,* ed. Herbert Simons (London: Sage, forthcoming).
3. I develop this history of the term in an unpublished paper, "From Hylemorphism to Hubris: A History of 'Information,'" presented at the International Communication Association, San Francisco, 1984.
4. F. E. Sutcliffe, "Introduction" to Rene Descartes, *Discourse on Method and the Meditations,* ed. and trans. F. E. Sutcliffe (New York: Penguin Books, 1968), 21.
5. Descartes, 35.
6. The theme of "innovative self-destruction" in architecture, art, and thought in the nineteenth and twentieth centuries is brilliantly discussed by Marshall Berman, *All that is Solid Melts into Air: The Experience of Modernity* (New York: Simon and Schuster, 1982).
7. Rorty, *Philosophy and the Mirror of Nature.*
8. Francis Bacon, "The Great Instauration," in *The English Philosophers from Bacon to Mill,* ed. E. A. Burtt (New York: Modern Library, 1939), 11.
9. Lewis Mumford, *The Pentagon of Power,* vol. 2 of *The Myth of the Machine*

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(New York: Harvest, 1970), 81. This work, along with Rorty's *Philosophy and the Mirror of Nature,* has shaped my reading of Descartes and my understanding of his project.

10. Norbert Wiener, *Cybernetics, or Control and Communication in the Animal and the Machine,* 2nd ed. (Cambridge: MIT Press, 1961 [1948]), 39.
11. Hans-Georg Gadamer, *Truth and Method,* trans. Garrett Barden and John Cumming (New York: Crossroads, 1982 [1965]), 310–25, esp. 316–21.
12. On this theme see James W. Carey and John J. Quirk, "The Mythos of the Electronic Revolution," *American Scholar* 39, no. 2 (Spring 1970): 219–41 and 39, no. 3 (Summer 1970): 395–424.
13. Peter Gay, *Style in History* (New York: Basic Books, 1974).
14. Wiener, 164.
15. William James, *Pragmatism* (New York: Meridian, 1974 [1907]), ch. 1.
16. Henry David Thoreau, Civil Disobedience, in *Walden and Civil Disobedience* (New York: Norton, 1966), 243.

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Milton Mueller

TECHNOLOGY OUT OF CONTROL

THE WHALE AND THE REACTOR:
A SEARCH FOR LIMITS IN THE AGE OF HIGH TECHNOLOGY

by Langdon Winner

Chicago: University of Chicago Press, 1986. 200 pp. $17.50

AUTONOMOUS TECHNOLOGY: TECHNICS-OUT-OF-CONTROL AS A THEME IN POLITICAL THOUGHT

by Langdon Winner

Cambridge: MIT Press. 1977. 386 pp., $7.95 paper

TECHNOLOGICAL CHANGE AND THE TRANSFORMATION OF AMERICA

edited by Stephen F. Goldberg and Charles R. Strain

Carbondale: Southern Illinois University Press, 1987. 240 pp., $19.95

TECHNOLOGY, THE ECONOMY AND SOCIETY:
THE AMERICAN EXPERIENCE

edited by Joel Colton and Stuart Bruchey

New York: Columbia University Press, 1987. 287 pp., $35.00

The issue of technology is critical to social theory because, as these books demonstrate, the subject cannot be raised without immediately stumbling into a paradox. The paradox concerns the nature and mean-

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ing of social control. The artifacts produced by a human culture reflect, and by reflecting act to perpetuate, certain kinds of social relations. If we ask what *controls* those relations, artifacts or the people who produce them and organize themselves around them, we will find no simple answer. A chicken-and-egg relation of reciprocity holds: people shape culture, culture shapes people.

The problem is fundamental to any theory of society or culture but is particularly prominent in current discussions of technology. On one hand, what we call "technology" gives us unparalleled power. We can stop the spread of diseases, exploit energy resources, expand the scope and speed of communication and transportation, produce food and goods in abundance. An urban environment is almost entirely a human product and thus is in some sense under human control. Yet it is just as obvious that the technological society is *not* under anyone's control, that its vast powers can only be attained through the coordinated activities of millions of people, most of whom will never meet each other—much less agree on common goals. The social environment thus takes on an external, objective character that conditions and controls the individual's existence no less than the predators in a jungle. The institutions that produce goods and deliver services become large, impersonal and remote; the individual's place in the social order comes to be defined by technological forces he can neither see nor understand. Put in its starkest terms, it comes down to a question of whether we control a technological society or it controls us. In the twenty years or so since they "discovered" technology, the social sciences and humanities have locked themselves into this paradox and have since failed to proceed beyond it.

The problem is especially acute in the works of Langdon Winner, whose bold thesis that technology is autonomous (whether or not it is true) advances the dialogue by making the paradox explicit and laying bare the conceptual confusion that leads into it.

Autonomous Technology

Winner's *The Whale and the Reactor* is an attempt to define a philosophy of technology. In some ways it is a popularization and clarification of the ideas first articulated in *Autonomous Technology* in 1977. Winner begins his most recent book by rejecting the idea that technologies are socially neutral, and that the only substantive issue concerning them is how they are to be used. The model of technology he attacks is best

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exemplified by the way people commonly speak of simple tools such as hammers or knives. They are seen as things that can be picked up, used, and put down with no power to affect the social order. They can be used for evil purposes (as weapons of aggression) or good purposes (constructing buildings or slicing food), but the things themselves are ethically and politically neutral.

Winner, in contrast, wants to argue that technological systems have inherently political qualities. By this he means that in the course of their construction and use society adopts certain kinds of decision-making processes and organizational patterns with distinctly political overtones. There are, he claims, two senses in which artifacts can be said to have politics. First, the design of a technology can produce social consequences *prior* to any specific uses. He adduces as an example the overpasses on the Long Island parkways, which were made very low to exclude buses, and with them poor people and blacks. But there are also cases of this sort where the prior effect is unintentional or unforeseen, rather than a deliberate choice. Here Winner cites the development of both the mechanical tomato harvester and the "hard tomato" by scientists at the University of California, the use of which concentrated tomato growing in fewer hands and eliminated the jobs of many tomato pickers.

Winner points to a second, stronger sense in which technologies can be said to be political. In this case the need to control and manage a large, complex system imposes certain institutionalized patterns of power and authority on society. His examples here are the plutonium recycling required by breeder reactors, the dangers of which could cultivate a regime of military security in the civilian sector, and Alfred Chandler's thesis that the operational requirements of the railroad in the late nineteenth century required hierarchical administrative management.[1]

These examples are taken from *The Whale and the Reactor.* In *Autonomous Technology,* Winner sets forth a more radical version of the argument that artifacts have politics. Technological systems, he claims, attain a kind of autonomous, self-perpetuating existence; they become "severed from the ends originally set for them, and, in effect, reprogram themselves and their environments to suit the special conditions of their own operation" (p. 227). In this process, which he labels "reverse adaptation," "the system" defines and creates its own purposes independently of other social influences. The theme of autonomy has been toned down considerably in *The Whale and the Reactor,* but the basic conviction that technological development is literally out of control remains.

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Winner is not, however, proposing a technological determinism of the sort we might asssociate with Karl Marx or Harold Adams Innis. Such an interpretation can be read into *Autonomous Technology,* but *The Whale and the Reactor* is much clearer in this respect. Technology is not conceived as an exogenous force which controls our history. Rather, technical structures must be evaluated in light of the way they embody and reinforce "conditions of power, authority, freedom and social justice" (p. 40). In Winner's opinion, the choice of technologies promotes social configurations with their own distinctive moral and political characteristics.

A true technological determinist would be willing to acquiesce in whatever technology wrought. The whole thrust of Winner's work is in the opposite direction: he wants the technological to be completely subordinate to the political. His argument for the existence of technological autonomy is only a means of identifying the enemy. He objects to the fact that we "sleepwalk through the process of reconstituting the conditions of human existence," that social change proceeds according to principles and standards that are not explicitly formulated and agreed upon by human communities. This state of affairs is given the pejorative labels "technological drift" and "technological somnambulism."

The Control of Technology

Winner's goal, then, is to establish conscious control over the process of technological evolution. By this he does *not* mean merely controlling threats to health, safety, or the environment—the "bad side effects" of technological development. In fact, he complains that such an approach "severely restricts the range of moral and political criteria that are permissible in public debate" (p. 50). His program should not be confused with an ecological or conservationist one. Winner, rather, wants to subject technical development to a "postiviely articulated idea of what society ought to be." Society should "try to guide its sociotechnical development according to self-conscious, critically evaluated standards of form and limit." To understand what he is driving at, we must refer back to the idea that technical structures *embody* moral and political decisions. The idea that politics is the "form" that inhabits the "matter" provides the rationale for taking apart our unruly technical order and consciously reconstructing it in conformity with society's conception of virtue. His program for change is drawn not from Marx's *Capital* or from the ecologists, but from Plato's *Re-*

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public. Only in his case, "the people" will assume the benevolently dictatorial role of the philosopher king.

For the most part, the ideas and topics presented in *Technological Change and the Transformation of America* and *Technology, the Economy and Society* sound the same note as Winner's books: technology is something that can and must be brought under conscious control. They tend to fall somewhere along the following spectrum.

There are, first, the "technology assessors." This group responds to the increasing complexity of the man-made environment by proposing to assess rationally how a technological innovation will affect the "total environment." Studying technological change, in this model, is like studying the side effects of a drug. At a fixed point in time, some static entity called "society" is faced with "choices among alternative technologies." New technologies are "proposed" much like new laws or the construction of freeways, and social scientists are set to work on the problem of discovering their "impact." Colton and Bruchey, in their introduction, recommend "planned social effort, accompanied by the allocation of adequate resources for the study and control of the problems inherent in modern technology" (p. 18). A chapter entitled "Community Planning" in the Goldberg and Strain book describes how a "technological impact statement" can be used by community organizations to acquire "leverage" over the process of economic development.

From this it should be clear that the notion of "technology assessment" represents the bastardization and cooptation of theories of technology by the regulatory state. The premise that technological change can be scientifically assessed and controlled has no basis in history or social science, and yet the promise of rational control is used to extract resources for yet another army of academic experts and white collar consultants, or to make politicians look as if they are responding responsibly to the problems of the environment.

The second position in the spectrum is occupied by the "communitarians," who share some of the positivistic assumptions of the technology assessors but emphasize that the assessment and adoption of technology must flow from a set of "common values." This viewpoint is represented in the Goldberg and Strain book by Leo Marx and Albert Borgmann. Marx argues that the original idea of progress formulated by such eighteenth-century liberals as Jefferson, Franklin and Adams was informed by the values of human liberation and equality. These ideals, however, were discarded in the course of the nineteenth century in favor of technical progress for its own sake. Marx believes

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that "we urgently need a set of political, social and cultural goals comparable to those formulated at the beginning of the industrial era if we are to make accurate assessments of the worth of new technologies." Borgmann's challenge goes even deeper. He argues that the communitarian critique of liberalism formulated by writers like Michael Sandel, Robert Bellah and George Will[2] should be translated into a critique of technology, for it is technology that loosens the bonds of collective cohesion and makes it possible for individuals to live autonomously. Technological fixes thus provide an alternative to ethical, communitarian approaches to solving social problems.

In their own peculiar ways, the works reviewed here are all trapped within the paradox of social control. With few exceptions, they respond to the problems posed by the technologization of the environment in ways that fundamentally misconceive the relationship between human intelligence and the social order, and hence radically misconstrue the *kinds* of control that are really available to us.

Autonomous Intelligence

The epithets and arguments Winner uses to establish the autonomous, political character of technology could also be applied to any product of human culture, technological or not. Language is the most important and obvious example. "Conditions of power, authority, freedom and social justice," to use Winner's words, are reflected in and reinforced by the way we speak about them. Whether we call a female a "girl," a "woman," a "lady" or a "broad," to cite a simple example, has ethical and political import. Language is not something that we just "use" to communicate and then lay aside like a hammer or a knife; it structures our perception, thought and social relations. Our choice of words, reasoning methods or conceptual categories can enforce some conclusions on us to the exclusion of others, just as the arrangement of technologies can produce some results prior to any actual uses.

Even more to the point, languages evolve autonomously. The phenomenon of "linguistic drift"—the name the linguist Edward Sapir gave to the gradual grammatical changes in language over the generations—occurs as the cumulative product of millions of individual acts of speech. Its course is directed by no one and cannot be predicted as such, yet it follows a definite, stable pattern. Somnabulism, anyone?

The paleoanthropologist Ralph Holloway and the psychologist

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Jerome Bruner have both argued, in Bruner's words, that "the simultaneous appearance in man of language and tool using suggests that the two may derive from some common programming capacities of the enlarging hominid nervous system."[3] There are striking similarities in the psychological processes involved. In both language and tool using, arbitrary units of the environment (sounds, stones, wood) are detached from their natural context and rearranged to form new utterances or objects. Both also share a structural similarity in the way they are reproduced among a human population. When human populations are isolated or distant from each other, their dialects, grammar and repertoire of tool-making techniques will begin to drift apart and take on distinctive features of their own.

Like many other writers on the subject, Daniel Bell attempts to draw a line between *homo faber,* man the toolmaker, and *homo pictor,* man as symbol producing creature,[4] as if they represented different aspects of human capability. But technology as we know it would not be possible without the ability to conceive of abstract forms or symbols, and extensive symbol use is inconceivable without tool use. The capacity of humans to encode knowledge linguistically or symbolically is greatly expanded by the presence of technologies such as writing, computational devices and measuring instruments. The ability to make and use tools, on the other hand, feeds on the communication of experience, data and techniques through language.

But the analogy does not just hold for language. Any social institution—the Catholic church, the public schools, a government bureaucracy like the Drug Enforcement Agency or the Pentagon—might also be seen as an embodiment of moral or political values. Each of these institutions tries as hard as it can to "restructure social reality" to suit its own purposes. Each of them will, given the chance, create a crisis to justify or perpetuate its own existence. Each has a tendency to extend its own particular mode of reasoning and decision making (religious, military, bureaucratic) into other realms of society. If these are the criteria that make technology autonomous and political, then they apply with equal force to nearly all aspects of human society, but particularly to language.

These parallelisms encourage the suspicion that the issues Winner and the other critics raise are not problems of technology *per se,* but of some other, more fundamental characteristic of human society. In fact, the autonomy of technology and language are not recent mistakes or excesses dating back only to the industrial revolution. They are inherent features of the biological niche humans have occupied. The unique

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feature of this niche, which can be described as "cultural," is that it shifts much of the intelligence needed to survive to the external world of objects and social relations.

In terms of their brain size and capacity, contemporary human beings are probably no more intelligent than Neanderthals.[5] Even in terms of their individual knowledge, modern human beings may not know significantly more than Egyptians or Greeks of several thousand years ago. The vast accumulation of knowledge, technique and resources that constitutes modern civilization is available to us but is also *outside* of us—and it does indeed seem to have a life of its own.

Toolmaking appears in the hominid archaeological record about 2.5 million years ago, long before there is any evidence of language.[6] The ability to bang rocks together to create chips with sharp edges was learned and transmitted across generations. But without linguistic communication, the technique of stone toolmaking was passed on essentially unaltered for millenia. As Glynn Isaac observed, "The early stages of material culture were by our standards incredibly long-lasting and static."[7] The character of hominid toolmaking changes radically, however, once language is present.[8] Toolmaking becomes progressive and cumulative. Its production processes become more elaborate and involve multiple stages. The tools themselves begin to show a "linguistic" reproduction pattern in that there is clear regional variation in style and technique. Moreover, the size of the brain relative to the body, which had doubled over the previous two million years, stops increasing,[9] suggesting that the evolution of intelligence was proceeding in other ways.

Thus, technology and language are inseparable components of the unique biological niche known as cultural adaptation. The powerful fusion of toolmaking and linguistic communication allows humans to take on tasks requiring complex coordination and division of labor, to learn and build and pass on the products of culture. What we have here is an autonomy of intelligence, not of technology alone. Human culture thrives precisely because it objectifies, divides, distributes and then coordinates the knowledge needed to cope with the environment. A socially constructed ecosystem of artifacts, techniques and organizations mediates between human life and the natural environment. I deliberately call it an ecosystem in order to assault the pernicious dichotomy between the "natural" and the "artificial" (i.e., human). The ecology of artifacts and social relations is part of nature and is governed by natural laws and constraints no less than the rest of the world, e.g. by the laws of economics, or by the constraints on

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coordination and communication that make it impossible for a city of six million to be organized in the same way as a tribe of a few thousand.

The Control of Artifacts

The point of this anthropological excursion has been to pave the way for (1) a different conception of technology, and (2) a far more realistic idea of what it means to exert "control" over it.

(1) The form taken by a technological system is not a *design* but an *evolutionary trajectory*. The trajectory is defined as its operations adjust to the specific social, geographic, economic and political characteristics of its environment, and overcome the technical problems posed by its growth and its competition with other technologies. Anyone familiar with the history of a large-scale technological system knows that an attempt to implement the simplest idea can create vast numbers of unforeseen problems. It is the process of solving these problems—not a preconceived design—that gives the system its shape.

The early developers of the telephone, for example, were immediately confronted by a host of problems, and none of Alexander Graham Bell's simple experiments provided any clue to solving them: how to get rights of way for wires from municipalities, how to organize large numbers of wires coming into a central office, how to transmit voice signals through buried cables, how to avoid interference from telegraph lines and electrical trains. Around each of these problems—and hundreds of others—a whole new branch of specialized technique de-developed which contributed in significant ways to the specific form taken by telephone communications in the United States.

The process by which the surrounding society adapts to the utilization of a new technology is equally complex. Specialized uses are discovered which confer an advantage of some kind on their users. These practices are imitated or improved upon by others in a never-ending sequence, resulting in shifts of power and organization that are unpredictable in principle. This is why the claim that technology assessment can give us useful knowledge about the future social effects of new technologies is fraudulent. Technologies are known *through* their uses and social effects, not prior to them. At best, technology assessment can compare existing technologies, describe how they are being used, or trace the evolutionary trajectory they have taken in the past. But it

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will never be able to predict the form a technology will take or guide the form a technology *should* take.

A technology assessor of 1950 would have told us that "the computer" was a huge and highly expensive device that would probably be confined to big science and the military. Even supposing he had been a visionary futurist capable of projecting the possibility of personal computers and pocket calculators (as in fact many science fiction writers did), such projections would have been so unspecific as to be meaningless: he would not have known when these devices would be available, what technology they would employ or how much they would cost, and thus no statements about their effects on society could be justified. Indeed, to this day we still cannot say with any precision how computer technology has changed our society, because its applications are so numerous, ranging from medical diagnosis to accounting to video games, that no single person can comprehend all of them.

(2) I want to make it clear that this kind of approach does not exempt technological systems from criticism or conscious efforts at change. In fact, focusing attention on the reciprocity between the system and its environment reinforces rather than contradicts Winner's thesis that the structures of technology embody a kind of latent politics. It does, however, rule out Winner's approach to the control of technology. Winner would, as best as can be determined from his book, subject every kind of technological change to political evaluation in the embryonic stages of its development. Preconceived political and ethical ideas about what a technology ought to be will determine whether and to what extent it is developed. From the foregoing it should be clear, however that such preconceptions will at best prove irrelevant, and at worst mindlessly restrictive, when imposed in advance of development.

Humans are inherently incapable of exerting the kind of control over the process of cultural evolution that Winner seems to want. This becomes particularly clear when we consider that the arguments Winner makes about technology have already been made about language. The idea that language is not just an instrument for communicating ideas but is the shaper of ideas and hence conditions our behavior is essentially Winner's thesis couched in linguistic rather than technological terms. This idea was first formulated by the linguists Benjamin Whorf and Edward Sapir around 1920.[10] For a short time, the Sapir-Whorf thesis encouraged a belief that unlocking a culture's linguistic code would provide a shortcut to knowledge of its deepest beliefs and

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experiences. Of course, this hope was quickly dashed; linguistic codes interlock with and acquire meaning from all other aspects of a culture. The Sapir-Whorf thesis now has the status of an empty truism.

At roughly the same period in history, positivist philosophers were attempting to exert "scientific" control over language. The spirit of their investigations is encapsulated in this quotation from Ogden and Richards's *The Meaning of Meaning:*

> Tens of thousands of years have elapsed since we shed our tails, but we are still communicating with a medium developed to meet the needs of arboreal man. We may smile at the linguistic illusions of primitive man, but we may forget that the verbal machinery on which we so readily rely, and with which our metaphysicians still profess to probe the Nature of Existence, was set up by him, and may be responsible for other illusions hardly less gross. . . .[11]

Ogden and Richard set up a taxonomy of signs and a set of six Canons to govern "the right use of Words in Reasoning." They were following the lead of the pragmatist philosopher C. S. Peirce, who also created an elaborate classification of the signs used in language. Peirce's classificatory scheme, however, became tangled in its attempt to sort out different levels of reference; it ended up with 59,049 types of signs. The bewildering complexity of his analysis completely defeated its purpose, and thus was a fitting conclusion to the attempts to impose an artificial order on the process of linguistic communication. Nor did the attempts to create an artificial "universal language" such as Esperanto have any success. From the perspective of the 1980s, ordinary language is sufficiently rich, useful and flexible for most purposes; it is the Canons and taxonomies of the philosophers that seem primitive.

Can we then have any control over language? Of course—but of a very modest type which requires an enormous amount of work to exercise. We can, for example, establish communities of discourse in which specific words or symbols are given precise meanings and no others are recognized. Scientific conferences and standard-setting institutions are instances of this practice. We can, in books, articles, speeches or conversations, propose what we think are appropriate names or interpretations and try to persuade our listeners to abide by them. Note that this kind of "control" over language is always confined to specific meanings as they occur to specific people in specific places and times, and depends for its success on the ability of the proposed changes to get themselves accepted and spread spontaneously. It does not encompass the imposition of abstract ideas about "what lan-

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guage ought to be." Even if we try to "guide linguistic development according to self-conscious, critically evaluated standards of form and limit," to paraphrase Winner, we can do so only by engaging in discourse with people who may not share those standards or goals, and hence the outcome of our efforts will always be something different than what we expected.

What is true of language is true of technology. Winner is correct in pointing out that the technological choices a society makes reflect and embody its politics. But one cannot control the conditions that give structure to a medium such as technology or language by manipulating the medium alone. Aside from the very strong possibility that efforts to manipulate technology will simply prevent it from working effectively, imposing a preconceived "democratic" structure on technology will not produce a "democratic" society, any more than printing money makes people richer or calling Langdon Winner "the President of the United States" gives him the same power as Ronald Reagan. True, one of the unique characteristics of human culture is that manipulating media *can* bring about the desired effects for a short time: printing money *does* make the counterfeiter richer; adopting a false identity can make a person more powerful among those who are fooled; and thus, I suppose, rearranging technologies in accordance with some political ideal could, provided the technologies still worked, have some of the desired effects for a brief period. But unless the form created by the manipulation of the medium is sustained and reinforced by the underlying social reality, the illusion must eventually collapse.

An excellent example of a critical but reasonable approach to the control of technology is provided by Paul Camenisch in the Goldberg and Strain book. In "Medical Technologies and Communities of Moral Value," Camenisch discusses three cases in which people united by shared values have been able to redirect technology into paths more suitable to them. In one case, he explores the consequences of the Jehovah's Witnesses' refusal to allow blood transfusions to be performed on them. This "conscientious objection" to a specific form of medical technology successfully put pressure on the health care system to recognize some of the risks of transfusions and to find alternative technologies for dealing with blood loss. Next, Camenisch discusses the hospice movement, a response to the prolonged, highly technological and often dehumanizing forms of life extension used by hospitals. Out of concern that the dignity and importance of dying were being smothered by the intervention of medical technology, hospices offer a setting in which patients beyond the hope of recovery can die

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without overwhelming technological intrusion or restricted access to family and friends. Since 1974 the number of hospices has grown from zero to 800. His last example concerns the way the medical profession has confronted the issue of artificial heart implantation. After the death of three implant recipients, an informal moratorium has taken hold, but Camenisch believes that physicians have not have been as helpful as they might have been about informing the public of the artificial heart's potential risks and benefits. The conclusions he draws from this are worth repeating:

> First, neither the technological imperative nor the momentum of emerging technologies need overwhelm all countervailing values. Second, specific technologies can be resisted or redirected in their applications to limited communities. Third, those efforts may positively affect the use of those technologies in the larger society. Fourth, one of the major conditions for such resistance and redirection is the existence of a community which perceives in the technology significant disvalue, and whose shared values provide it with a place to stand as it tries to limit or redirect technology. (p. 128)

Politically Determined Technology

There is a long history of attempts to impose preconceived ideas on the course of a technology's development. Technology unconstrained by politics is the historical exception rather than the rule. Yet Winner and other advocates of a politically determined technology have made no effort to evaluate the record. If we survey the history of these attempts to give technology "form and limit" according to political ideals, we come to the following conclusions.

First, while idealistic preconceptions can play an important role in the negotiations over the fate of a new technology, the outcome never conforms to them. If it survives at all, the actual form the technology takes responds to economic, political, and administrative realities that were never a part of the original vision. Preconceptions that are unrealistic, in fact, can be extremely destructive. For example, during the 1970s many idealistic students of the electronic media, convinced that interactive cable TV provided an intrinsically democratic form of communication capable of rousing the masses from passivity, brought their preconceptions to the cable franchising process, where they had considerable influence. Their main accomplishment, however, was simply to delay the introduction of cable in many major cities for a decade or more by imposing unrealistic demands on the franchisees.

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Second, the pattern imposed on a technology by political agencies invariably mirrors the prevailing power relations. Generally, the political constitution of technology is a conservative process, protecting established interests against the incursions of newcomers. When Winner talks about the conscious control of technology's form, it's clear that he has something like the Putney debates in mind: a democratic forum where all of the people come together to make decisions. A more realistic model of what we can expect a politically determineed technology to be like is the creation of RCA in 1919, in which the President, the Navy and the Congress brought the major corporations controlling radio patents together to form an "instrument of national policy" in the field of radio so that the military would be assured of access to the latest technology.

Third, ideas of "form and limit" can quickly become obsolete or unworkable. The scheme of broadcast regulation created after 1926 is a good example of a politically imposed pattern: broadcasters were defined as local entities, stations were distributed over geographic areas according to criteria of equity established by Congress, and the stations were defined as "public trustees" subject to licensing by a federal commission. By the 1960s, however, the whole definition of a "broadcaster" was threatened by the existence of cable systems. For a while, the Federal Communications Commission responded by simply suppressing cable. When it stopped doing this the boundaries of regulation had to be completely revised; they are still in the process of revision. Anyone who has followed the attempt of regulators to establish a boundary between the regulated world of telecommunications and the unregulated world of computers can also attest to how tricky the process of imposing conceptual categories on technology can be.

Fourth, the only way to prevent the kind of dynamism that leads to the problem just described is to subject the process of technological change to a degree of control that can only be described as totalitarian. It is revealing, for example, that the problems of shifting technological boundaries in telecommunications did not arise in the communist world, and only very slowly in western European countries with centralized, monopolistic telephone and broadcasting systems. The reason is simple: in these countries there are few cracks in the system of control, few autonomous decision centers where new ideas can take hold and develop spontaneously. But if this path is chosen we have merely exchanged the allegedly overcentralized and hierarchical structures of competing corporations for the far more centralized hierarchies of the state. Winner would undoubtedly reject such an option, but it is hard to understand how technological development could be

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subjected to consciously articulated goals without giving centralized bureaucracies sweeping powers over scientific, technological and economic activity.

Liberalism & Technology

It would seem that liberalism is the real target of the philosophical attack on technology. For liberalism welcomes the autonomy of intelligence by encouraging freedom of expression and by providing the framework for a market economy, in which spontaneous technical development, specialization and the division of labor are given maximum play. Liberalism also recognizes that the complexity of social cooperation has progressed far beyond the point at which it can be integrated by any single set of values.

Marxists, communitarians, radical democrats and religious fundamentalists from Khomeini to Falwell are alike in their refusal to accept this. The democrats may pay lip service to pluralism, but their real goal is a society in which "citizenship" is primary and politically articulated common goals the organizing principle. What galls the Borgmanns, Sandels and Winners about contemporary society is its lack of an overriding common purpose. In effect, they refuse to accept the verdict of two centuries of religious warfare, the post-Reformation separation of the civil and religious spheres. Their aim is to reintegrate the autonomous individuals and communities of a liberal society into a single community defined by politics or religion.

These critics of liberalism sense that a freely developing technology is their enemy, because it provides a framework for impersonal and invisible cooperation among people whose values, religions or beliefs are so different that cooperation under any other terms would lead to irreconcilable conflict. Technology provides the entry point for spontaneous, uncontrolled change in the social order, change that is unmotivated by any preconceived, officially sanctioned public purpose. They sense that liberalism coupled with technology places society as a whole beyond anyone's conscious control. They are right.

NOTES

1. Alfred D. Chandler, Jr., *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, Mass.: Harvard University Press, 1977).
2. Michael J. Sandel, *Liberalism and the Limits of Justice* (Cambridge: Cambridge University Press, 1982); Robert N. Bellah, et al., *Habits of the*

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Heart (Berkeley: University of California Press, 1985); George F. Will, *Statecraft as Soulcraft* (New York: Simon and Schuster, 1983).

3. Jerome Bruner, "The Nature and Uses of Immaturity," *American Psychologist* (August 1972): 687–708. Ralph Holloway, "Culture: A Human Domain," *Current Anthropology* 10:395–407.
4. Daniel Bell, *The Winding Passage* (New York: Basic Books, 1980), 6.
5. Paul Changeaux, *Neuronal Man: The Biology of Mind* (Oxford: Oxford University Press, 1983), 256.
6. Nicholas Toth, "The Oldowan Reassessed: A Close Look at Early Stone Artifacts," *Journal of Archaeological Science* 12:101–120.
7. Glynn L. Isaac, "Stages of Cultural Elaboration in the Pleistocene . . ." in Harnad, Steklis and Lancaster, eds., *Origins and Evolution of Speech and Language* (New York: New York Academy of Sciences Proceedings 880 [1976]).
8. Because language does not fossilize, the exact date of its onset remains uncertain. However, vocal speech requires important changes in the bone structures defining the respiratory system and the position of the tongue and the pharynx. The necessary changes do not seem to have taken place until about 700,000 years ago at the earliest, and many specialists believe that language evolved much later, as recently as 35,000 years ago. See Phillip Lieberman, *The Biology and Evolution of Language* (Cambridge, Mass.: Harvard University Press, 1984).
9. Phillip V. Tobias, *The Brain in Hominid Evolution* (New York: Columbia University Press, 1971).
10. Benjamin L. Whorf, "Science and Linguistics" (1940) in J. B. Carroll, ed., *Language, Thought and Reality* (Cambridge: MIT Press, 1956); Edward Sapir, *Language* (New York: Harcourt, Brace and Co., 1921).
11. Ogden and Richards, *The Meaning of Meaning* (New York: Harcourt, Brace and Co., 1956).

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Ralph Rector

HAS MARKET COORDINATION BEEN REPLACED?

THE VISIBLE HAND:
THE MANAGERIAL REVOLUTION IN AMERICAN BUSINESS

by Alfred D. Chandler, Jr.

Cambridge, Mass.: Harvard University Press, 1977. 608 pp., $9.95 paper

STRATEGY AND STRUCTURE: CHAPTERS IN THE HISTORY OF THE AMERICAN INDUSTRIAL ENTERPRISE

by Alfred D. Chandler, Jr.

Cambridge, Mass.: M.I.T. Press, 1962. 463 pp., $9.95 paper

The modern business enterprise, unlike other economic institutions such as markets, is a relatively recent phenomenon. Yet many social scientists, and particularly many economists, assume that modern corporations are simply larger versions of the eighteenth-century companies Adam Smith studied. Those holding such a view have been challenged by the arguments Alfred Chandler offered in his books *Strategy and Structure* and *The Visible Hand*. In these comprehensive yet detailed studies, Chandler documented the technological and managerial innovations that produced modern business enterprises in America, claiming that modern economic coordination results more from conscious, intentional planning provided by managers than from the market's "invisible hand" of price adjustments. These widely accepted claims merit reconsideration.

In *Strategy and Structure* Chandler examined the reasons why four

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large companies altered their organizational structures and he explored the impact of these changes on the managerial organization of other firms. Employing the method of case study analysis, Chandler provided detailed narrative accounts of organizational changes which occurred in the DuPont Company, General Motors, Standard Oil Company (New Jersey), and Sears, Roebuck and Company during the first half of the twentieth century. Despite important differences between these companies, each ultimately adopted a multidivisional or M-form structure.[1] Chandler's thesis is that structure follows strategy. Relying on historical accounts of organizational change for evidence, he explains that strategic decisions by top management officials regarding their companies' growth led to the implementation of structural changes that significantly improved the operation of these companies. "Strategic growth resulted from an awareness of the opportunities and needs—created by changing population, income, and technology—to employ existing or expanding resources more profitably. A new strategy required a new or at least refashioned structure if the enlarged enterprise was to be operated efficiently" (p. 15).

In *The Visible Hand* Chandler broadens his analysis to study the growth strategies used by American businessmen in a wide variety of industries. Chandler identifies two strategies which led to the emergence of new management structures from the 1840s to the 1920s. Some companies sought vertical integration to create their own marketing and purchasing operations. Others followed the strategy of horizontal integration and expansion by merging with their competitors. In addition to providing many examples of firms whose acceptance of vertical and horizontal growth strategies caused them to adopt new organizational structures, Chandler claims that the newly created management structures that have emerged from these strategies represent a "visible hand" that has to a large extent replaced the market's "invisible hand" as a coordination mechanism. The structural changes produced by these two strategies "took the place of market mechanisms in coordinating the activities of the economy and allocating its resources" (p. 1).

Management vs. Market

Chandler's analysis of the strategies and structures employed by American business was important because it revealed how owners and managers developed different organizational structures to increase the ef-

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ficiency of their firms. Economists studying these issues had limited their analysis to a study of "objective" factors—such as market size, economic concentration, technology, and transactions costs—which impose constraints on firms that determine the particular organizational structure chosen by profit-maximizing businessmen. In contrast, Chandler's historical analysis includes an examination of the "subjective" process of managerial decision-making. He criticizes economic theory because it ignores historical evidence that managerial choices regarding growth strategies produced new administrative structures.

Despite the inclusion of historical information regarding the interpretations of economic events by managers, the form of Chandler's generalizations concerning organizational change remains similar to that of traditional economic theory. For the purpose of developing generalizations, both assume that it is more important to understand the objective constraints that decision-makers face than it is to examine the subjective interpretations agents make regarding their situation. While Chandler's historical narrative is rich in detail regarding the process by which managers devise strategies and structures, he explains their development in objectivistic terms as a response to the forces of technological innovations and increased consumer demand. Chandler also adopts the traditional standard of successful actions as those that objectively optimize the allocation of resources. Even though he often documents the existence of evolutionary processes in which firms grope for solutions, his thesis emphasizes the rational, intended consequences of strategic and structural decisions made by managers.

Chandler's disjunction of market and management is reflected by, and is to some extent a product of, economic theory. F. A. Hayek's distinction between unintended and intended consequences has become an influential basis for distinguishing "self-generated orders" such as markets from "organizations" such as firms.[2] Hayek argues that because the human mind and society are both the product of evolutionary development, many social institutions in complex, highly developed societies are self-generating orders or "spontaneous formations." Institutions such as markets and language which emerge spontaneously are the result of a gradual and unplanned process of adaptation in which success is not dependent on the execution of preconceived rules.

In contrast to self-generated orders, organizations are "deliberate constructions" which are consciously based on rational principles, intended to further specific objectives, and governed by explicit rules. Hayek explains:

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> What distinguishes the rules which will govern action within an organization is that they must be rules for the performance of assigned tasks. They presuppose that the place of each individual in a fixed structure is determined by command and that the rules each individual must obey depend on the place which he has been assigned and on the particular ends which have been indicated for him by the commanding authority. The rules will thus regulate merely the detail of the action of appointed functionaries or agencies of government.[3]

After considering Hayek's arguments that self-generating orders and organizations are fundamentally different, many economists have concluded that markets and firms are polar opposites. An example of this influence can be seen in Ronald Coase's classic 1937 article on the theory of the firm which Chandler refers to in his *Visible Hand*. Coase cites Hayek's work to support the view that market coordination and coordination within firms are mutually exclusive.[4] Because economists think of the economy as coordinated by an impersonal and spontaneous price mechanism, Coase writes that "it can, I think, be assumed that the distinguishing mark of the firm is the supersession of the price mechanism."[5] Such a dichotomy between the concepts of "market" and "organization" is particularly important in theoretical economics where industrial organization economists such as Oliver Williamson[6] have concluded that the existence of integrated firms or "visible hands" prove that these planned organizations are, at least at the margin, more efficient than markets in allocating resources.[7]

The Dynamic Reality

The critical error made by Hayek, Coase, Chandler and others involved the exaggerated degree to which they believed individuals can control organizations such as firms by adopting explicit rules. The conscious, deliberate creation of these rules is for Chandler the essence of "visible hand" coordination. The creation of such rules also provides a theoretical link between the case studies of his first book and the thesis of his second. Chandler claims that the firms he analyzes in *Strategy and Structure* first adopted a growth strategy which later affected their organizational structure. It is this new organizational structure that Chandler claims has replaced market coordination. While he provides ample documentation to support the idea that a causal relationship exists between organizational strategy and structure, Chandler's failure to see that structure can also affect strategy prevents him

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from recognizing a notable weakness in his thesis. Because his thesis ignores the unanticipated effects that an organization's previously adopted structure has on a newly chosen strategy, only one side of a two-part evolutionary cycle is identified in Chandler's work, thereby overstating the extent of managerial control.

For example, in *The Visible Hand* Chandler cites the DuPont Company as a firm whose managers were "highly rational," and he implies that the process of adopting a new managerial structure at DuPont was done with speed and care rather than through an evolutionary process. However, a careful reading of his case study analysis indicates something very different. Chandler's historical studies actually show that between the years 1872 and 1922, DuPont's growth strategy evolved as a series of responses to several "environmental" changes.[8] A consistent pattern exists in which the managerial structure adopted by DuPont in one period helped determine the relative strengths and weaknesses of strategies in the next period.

In the case of DuPont, price wars with small producers and large stockpiles of munitions left over from the Civil War created a major challenge to the company in the late nineteenth century. While local munitions firms were insignificant individually, as a whole their influence in the market led to erratic price fluctuations, including large declines in the price of explosives. According to DuPont's executives the basic problem was their inability to maintain price stability. Their initial solution to this problem was to obtain controlling interest in several of the smaller firms. The company quickly modified and linked this strategy to a structural change by forming the Gunpowder Trade Association (GTA). After the formation of the association, major munitions firms usually shared ownership in the smaller companies they bought out. From DuPont's perspective this combination of strategy and structure worked well. Chandler notes that among the many producers' associations, the GTA was "one of the longest lived, most stable, and effective."[9] However, while the intended outcome was apparently achieved, other unintended consequences also emerged.

The company intended to sustain its profits and the viability of the trade association through a strategy of obtaining a non-controlling interest in competing firms. The unintended consequence that followed was a change in the company's stock of assets, which allowed it to adopt new growth strategies. These opportunities were not realized until DuPont itself was purchased by three family members in 1902. The acquisition of the old DuPont company was financed almost exclusively by issuing bonds and stock in a new holding company. While

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this arrangement minimized the amount of money the new owners had to provide initially, it also put significant pressure on them to produce revenue sufficient to cover interest payments on the bonds and to increase the company's net worth.

Consequently, DuPont's new executives worried far less about maintaining price stability than had their predecessors; they now faced a new problem. Because the GTA had focused exclusively on setting prices, administrative decisions regarding the operation of the smaller firms were usually made by the managers of those companies. After 1902, DuPont's managers believed that the primary obstacle to the increased profits they needed to cover the bonds was a lack of coordination between the principal companies owned by DuPont. Initially, DuPont's strategy called for horizontally integrating through the legal and administrative consolidation of its major holdings and for maintaining its status as an active member in the GTA. Executives at DuPont understood the new strategy as a means of enhancing the GTA's ability to provide coordination. By 1903, however, DuPont believed that an even more effective alternative existed. It abandoned the GTA and the practice of buying out competing firms in favor of a strategy that resulted in the complete ownership of all the firms it had invested in. To administer the larger company Dupont adopted a new managerial hierarchy. In a pattern consistent with Chandler's thesis in *Strategy and Structure,* then, the adoption of the new strategy of horizontal integration was followed by the creation of a new administratige structure. With the new managerial hierarchy, the DuPont company had little difficulty increasing the efficiency of its operations or satisfying its financial obligations.

The new strategies and structures that DuPont successfully employed did not emerge arbitrarily, however. Instead, they developed within an historical context. The company's growth followed a sequence in which managers first perceived a problem situation and adopted a strategy designed to solve the immediate problem. The new strategy then led to a managerial reorganization. Finally, the new structure itself created problems which, in turn, led to the adoption of new strategies.

By Chandler's account, the last phase of DuPont's growth occurred as a result of the company's near monopoly in the production of smokeless powder. The company had concentrated almost exclusively on producing this product to fill large orders placed by the allies during World War I. While these sales generated sizeable profits, DuPont executives anticipated that the war's end would expose the company to

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problems of oversupply and falling prices similar to those that precipitated the formation of the GTA. Based on their perception of the problems caused by excess capacity, DuPont adopted a strategy of diversification. DuPont took advantage of human capital and physical resources that were originally acquired with the sole intention of producing smokeless powder. The company examined a wide variety of products that could be produced using expertise and materials similar to those needed to manufacture munitions. After careful consideration of the alternatives, DuPont executives developed and then implemented a comprehensive diversification program.[10] Despite this conscientious work, however, organizational problems began to appear almost at once. The organization that had worked so well in peacetime and had withstood the stress of tremendous vertical integration during the war was unable to meet the challenge of diversifying DuPont's product line.

Amidst mounting losses, some managers advocated a plan for structural reorganization, but Irénée duPont, the company's president, opposed the idea. Those executives who agreed with him believed that the losses were almost inevitable given the company's inexperience with new product lines, and expressed the opinion that the problem could be solved by improving existing administrative procedures and producing more reliable information regarding inventory control and sales data. After learning that DuPont had lost money on each of its new product lines during the first half of 1921 Irénée, against his better judgment, finally agreed to adopt the innovative organizational structure identified by Chandler as the M-form. After examining the company's financial records for 1922, he admitted in the company's annual report that the new organizational structure was "definitely yielding good results." Within a year after adopting the organizational form that has become a standard among large diversified business, DuPont began showing profits for most of its products.

In DuPont's case each strategy the company's managers consciously adopted was followed by a change in organizational structure. Additional effects of the revised structure that were unintentional became apparent only after the company was confronted with an unanticipated problem. Chandler correctly concludes that corporate structure followed the conscious choice of strategy, but this is only one part of the story. The existence of market forces caused strategies that were adopted in one period to produce new problems and opportunities in the next period. The combination of previously adopted structures and the market worked together to provide the framework within which new strategies and structures emerged.

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Chandler's own evidence, then, shows that the market played an important role in each stage of DuPont's evolution. Company executives were motivated to adopt first new strategies and later new structures because of market forces. The creation of the M-form at DuPont, to take but one example, clearly was not the result of "visible hand" management but rather a last-ditch effort to avoid bankruptcy. The market not only set the agenda, but it provided a feedback mechanism to help DuPont's managers determine if their strategic and structural responses were appropriate. Nor did the market fade away as DuPont's organization became more complex. It continued to serve as the framework within which profits or losses were made and company policy was evaluated.

Based on this and other case studies provided by Chandler it is not unreasonable to expect that an evolutionary cycle similar to DuPont's can be found for many other firms. This conclusion is supported by the absence of historical evidence in Chandler's presentation that affirms the view that firms and markets are polar opposites. Instead, his work indicates that the organizational structure of firms is determined both by direct, conscious planning and by the spontaneous order of the market to which it responds. As with other social institutions, firms originate within a historical context and change as they adapt to their environment. Operating as open systems within the context of a market order, firms face two constraints: they must maintain structural integrity and be flexible in their adjustments to environmental changes. These constraints, combined with managerial interpretations of the feedback supplied by market forces, produce the changes in strategies and structures that Chandler has identified.

Chandler's works document the increasing degree to which the American economy has employed sophisticated managerial structures to coordinate complex processes of transferring, changing and expending resources. As phenomenological sociologists such as Alfred Schutz[11] have shown, the human mind adjusts to dynamic environments by developing rules which give structure to and stabilize the individual's relation to the world. In the social world both economic markets and firms develop through evolutionary processes and both perform a similar function—they are intricate, coherent webs of social rules, laws, norms and customs that allow individuals to anticipate the consequences of their actions and plan accordingly. Firms and markets are not isolated pockets of rules, but rather are interconnected systems which co-determine organizational characteristics such as management structure. From this perspective, "markets" are not "price mechanisms" which automatically produce tendencies toward equilibration

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of supply and demand. Markets are in fact social institutions within which prices and other economic data are produced, adjusted, and interpreted.

It is clear that firms operate under and are limited by *some* rules or environmental constraints that provide a context for recognizing problems and achieving solutions. The suggestion advanced here is to view markets in a broader context, to see them as providing constraints or rules which influence the course of economic competition and cooperation. If this position is correct, the increasing complexity of firm organization which Chandler documented so well is not proof of the "failure" or "inefficiency" of markets; it merely means that market organizations that were once relatively simple are becoming more complex.

The success of organizational structures such as large firms does not indicate any diminishing importance of markets. On the contrary, as Chandler's historical evidence and recent examinations of "socialist calculation" theory[12] have shown, planners such as private managers and state bureaucrats are able to effectively coordinate their plans only because their interpretation of economic events and relationships occurs within the context of market processes.

NOTES

1. Companies adopting an M-form structure have product or regional divisions. Each division in turn contains functional departments such as sales, manufacturing, and purchasing. Departments in M-form organizations are "decentralized" in that they are primarily concerned with the activities of individual divisions.
2. See especially F. A. Hayek, *Law, Legislation, and Liberty,* 3 vols. (Chicago: University of Chicago Press, 1973, 1976, 1979).
3. *Ibid.*, vol. 1, 49.
4. The article Coase cites is F. A. Hayek, "The Trend of Economic Thinking," *Economica* 40 (May 1933): 121–137. In this article Hayek refers to the observation by Ludwig von Mises that society is an organism and not an organization and he argues that "we are part of a 'higher' organised system which, without our knowledge, and long before we tried to understand it, solved problems the existence of which we did not even recognise . . ." (pp. 30–131).
5. R. H. Coase, "The Nature of the Firm," *Economica* n.s. 4 (1937): 389.
6. Oliver E. Williamson, *Markets and Hierarchies: Analysis and Antitrust Implications* (New York: The Free Press, 1975) and *The Economic Institutions of Capitalism* (New York: The Free Press, 1985).

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7. For a recent restatement of this argument see P. T. Wanless, "The Efficiency of Central Planning: A Perspective from 'Markets vs. Hierarchies,'" *Scottish Journal of Political Economy* 34 (February 1987): 52–68.
8. The sequence of intended and unintended consequences is presented more fully in Alfred D. Chandler, Jr. and Stephen Salsbury, *Pierre S. du-Pont and the Making of the Modern Corporation* (New York: Harper & Row, 1971).
9. Consumers may also have benefited from the association's existence. One example of consumers benefiting from cooperation between firms is contained in Robert L. Bradley, Jr, *Oil, Gas and Government: The U.S. Experience* (Washington, D.C.: Cato Institute, unpublished manuscript). For a theoretical treatment of the benefits of cartels see Jack High, "Bork's Paradox: Static vs. Dynamic Economic Efficiency," *Contemporary Policy Issues* 3 (Winter 1984–1985): 21–34.
10. See Edith T. Penrose, *The Theory of the Growth of the Firm* (New York: John Wiley, 1959) for a theory of the growth of firms based on the recognition that firms change their strategies and structures to more fully use excess capacity.
11. Alfred Schutz, *The Phenomenology of the Social World* (London: Heinemann, 1972), and Alfred Schutz and Thomas Luckmann, *The Structures of the Life-World* (London: Heinemann, 1973).
12. See Don Lavoie, *Rivalry and Central Planning: The Socialist Calculation Debate Reconsidered* (New York: Cambridge University Press, 1985).

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Richard M. Ebeling

COOPERATION IN ANONYMITY

ANONYMITY: A STUDY IN THE
PHILOSOPHY OF ALFRED SCHUTZ

by Maurice Natanson

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In "The Final Problem," the story that concludes *The Memoirs of Sherlock Holmes,* Professor Moriarty confronts the world's "only unofficial consulting detective" in his rooms at 221B Baker Street. Knowing that Holmes possesses the means to bring about his destruction within a matter of days, Moriarty is determined to persuade him to "stand clear . . . or be trodden under foot." But the outcome of their meeting is preordained: "All that I have to say has already crossed your mind," Moriarty says. "Then possibly my answer has crossed yours," Holmes replies. "You stand fast?" Moriarty asks. "Absolutely," responds Holmes. Thus is set in motion the events that must lead to their fatal embrace at the Falls of Reichenbach in Switzerland.[1]

But how can one man know the thoughts of another? If truth be told, all of us are usually uncertain as to what our own thoughts, and often our specific actions, will be an hour, a day, a week, a month, a year from now. How, then, can we ever hope to anticipate (correctly) the future thoughts and deeds of others? This problem is at the heart of efforts to understand society: How can a multitude of individuals participating in a complex and world-encompassing division of labor successfully coordinate and adjust their actions and minimize frustration and disappointment, when each participant possesses different and ever-changing knowledge and expectations about the possibilities of

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the future? Georg Simmel aptly expressed the dilemma, "How is Society Possible?"

The Economic Problem

For almost a hundred years mainstream, or neoclassical, economics resolved the conundrum by assuming it away. It constructed a model of a perfectly competitive market in which each agent in the arena of exchange was postulated as possessing "perfect knowledge." Each transactor was endowed not only with a complete and comprehensive knowledge of all objective technical possibilities through which resources could be combined to produce finished products, but also with complete and comprehensive knowledge of all the demands and supplies of every other trader, both in the present and into an infinite future. They were given that most intimate of accesses to their fellow men—the capacity to perfectly read each other's minds.

More recently neoclassical economics has endeavored to "loosen its assumptions." Agents, it is now admitted, possess less than full and perfect knowledge. Market participants may know some things, but not all things. The social dilemma has re-emerged: How do agents make decisions to fulfill their goals when the success of their own actions depends upon the decisions and actions of others? Neoclassical economics has found solace in the domain of statistical probability.

Rational Expectations theory—the graying "new wave" of economics—postulated that the subjective (or personal) probability estimate concerning the likelihood of any particular outcome in the market was equal to that outcome's objective probability, i.e., that probability value consistent with all the available information, one element of which was the "correct" theory of how the economic system within which individual decisions were made "really" worked. Any agent's planning or decision mistake could, therefore, only be the result of random error. The perfect knowledge postulate was reintroduced through the back door in the garb of "stocastic" theory.[2]

And what if the agent's initial information was insufficient to assure that his subjective judgments were equal to their objective probabilities? The agent would then shop around to increase his sample size. And he would continue to shop around for as long as the additional gain (in terms of a lower price or better quality in a product desired) was greater than the additional cost (in time or income spent) from one more search on the shopping expedition.[3]

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Whether in its Rational Expectations or Search formulation, the theory "works" only if at least two assumptions hold true: (1) there is sufficient repetition and constancy in social and economic events so that a probability distribution of outcomes can be constructed; (2) in all or most decisions market agents are only or primarily concerned with the probabilities of classes of outcomes rather than the turn of specific events.

Yet neither assumption is generally true. The presence of pattern and order, which are clearly essential and visible elements in social and economic relationships, need not imply repetition or regularity in a statistical sense. Language, for instance, bears a distinct logical pattern and order, yet the concrete form in which it is employed in everyday and creative ways is potentially infinite and impossible to "predict" statistically.[4] The same has been argued about the "market order," in which logical relationships and formal interdependent properties can be understood and explained, but the sequential historical events that emerge through time are not statistically predictable.[5]

As for the second assumption: by relegating all statistically non-predictable events to the "random error" category, Rational Expectations admits its own central weakness. It proclaims its great achievement as being a framework that enables prediction of everything except the unpredictable; yet unpredictable events are the ones requiring prediction if the plans and actions of agents are not to be disappointed.[6] It is not enough to say that if random events are "normally distributed" they will have an average mean value of zero. In much of ordinary as well as business life success or failure rides not on the average value of a series of outcomes over time, but on the specific next set of values of particular events.

How, then, can agents successfully anticipate the actions of their fellow men? This brings us to Alfred Schutz.

The Ideal Typification of the Social World

Since his death in 1959 at the age of 60, Alfred Schutz has come to be recognized as one of the most important philosophers of the social sciences in the twentieth century. Schutz's 1932 volume, *The Phenomenology of the Social World,* has become a classic of modern sociology.[7] His collected writings fill three volumes and cover a variety of social disciplines.[8] Schutz's unfinished treatise, *The Structures of the Life-World,* has

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recently been completed under the co-authorship of Thomas Luckmann.[9] And a recent intellectual biography by Helmut Wagner provides valuable insights into the evolution of Schutz's ideas and his scholarly and personal relationships with some of this century's leading social thinkers.[10]

Schutz's early intellectual environment was post-World War I Vienna. At the University of Vienna he studied law with Hans Kelsen, sociology with Othmar Spann and economics with Friedrich von Wieser. But the major influence on him in economics was Ludwig von Mises, who drew the young Schutz into the circle of youthful scholars who became known as the members of the *Mises-Kreis*. Here Schutz interacted on a regular basis with F. A. Hayek, Gottfried Haberler, Oskar Morgenstern, Felix Kaufmann and Fritz Machlup. A leading topic for discussion in the group was the methodology of the social sciences, and in particular the writings of Max Weber and the role of *Verstehen* ("understanding") as the main tool for analysis of human action.[11]

Schutz, in his own writings, tried to synthesize two strands of thought: Weber's idea of "action" as behavior to which an individual assigns a personal (or subjective) meaning; and Edmund Husserl's phenomenology of intentionality. With Husserl's philosophical foundation and Weber's methodological approach, Schutz's goal was to construct a theory of social action. Social action, following Weber, was human action in which the actors incorporated the possible actions of others into their own plans and modes of conduct; it consisted of intricate webs of "mutual orientation."

Maurice Natanson's *Anonymity: A Study in the Philosophy of Alfred Schutz* is not an exposition of Schutz's ideas, but an elaboration and explication of themes in Schutz's work. The central theme, in Natanson's eyes, is that we all live, work, interact with, and depend upon a multitude of "Others" about whose thoughts, actions and lives we possess few, if any, intimate details. In social life each of us is an anonymous being.

Fortunately we are born into a pre-existing social order, one that possesses structure, pattern, order and predictability. We each learn the secrets of this order through experiences in both childhood and adulthood. Experience teaches us to interpret the meanings embedded in the multitude of social relationships. The key to the interpretive process is "typification . . . the medium through which man in daily life finds his way through the anonymous structures of his everyday world" (p. 25).

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Anonymity

Typifications emerge out of social interaction and become formalized into *structures of intersubjective meaning*. Some illustrations may help. A potential customer steps on a used car lot and within five minutes the salesman concludes this is the type who he is finally going to be able to dump that "lemon" on; in turn, the customer has a picture in his mind of the typical used car salesman and the type of sales pitch that he is likely to expect. A depositor enters his bank and approaches the teller behind the counter with a conception of the typical demeanor and likely responses to be expected from the teller when certain banking services are requested; and, in turn, the teller has constructed from experience working in a bank a typification of a "bank depositor" and the typical kinds of things that such an individual will expect from the teller. A writer addresses his words to a community of "others," but with a conception of the "typical" reader, for example, of CRITICAL REVIEW, which influences and directs the manner in which he presents his argument and constructs his rhetoric; at the same time, the readers of CRITICAL REVIEW have a picture in their mind of the typical writer for CRITICAL REVIEW, a picture that leads them to look up from an issue and either say to themselves "Ah, just the type of articles I was looking for," or else "Damnit, what is this kind of author (or article) doing in CRITICAL REVIEW?"

Natanson argues that the process by which modes and motives of action are typified, enabling people to form judgments about the typical behavior or meanings to be expected in various social settings, intensifies social anonymity. Why? As typification becomes institutionalized in various social settings, individual characteristics are submerged in the particular "ideal types" relevant to the specific form of mutual orientation to which the actors in those settings conform. For example, regardless of the personal characteristics possessed by the individuals in question, each will tend to conform to the behavioral qualities expected from one who is a "railway conductor" or a member of the "Royal Canadian Mounted Police."

Yet, while Natanson convincingly demonstrates that typification has a tendency to reinforce social anonymity, the degree of depersonalization is not as stark or dramatic as he suggests. And it is Schutz who demonstrates why this is the case. Central to Schutz's analysis of processes of mutual orientation is the idea of varying degrees of intimacy among social actors. At one extreme is the category "other human beings," to whom can only be assigned those qualities and char-

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acteristics so broad and general that they would encompass any and all types of human action; e.g., man as pursuer of ends and applier of means. At the other extreme is what Schutz referred to as the "face-to-face" relationship in which the participating actors form typifications not of all men or some group of men, but of the particular other with whom one is interacting. Here the type-image created in the mind of one partner about the other incorporates numerous behavioral characteristics unique to that person (e.g., he starts stuttering whenever sex comes up in the conversation; he loses his temper whenever someone kids him about his height; you can often get him to buy you a drink if you compliment him on his singing). It is the intimacy of face-to-face conduct with various individuals in different social settings that enables people to say that they know how another would react in various types of circumstances, that makes someone say about another, "I can't believe he did that, it's so out of character from everything I have come to know about him," or to say, "She would never 'go' for him, he just isn't her type." These kinds of relationships are not supplanted in modern society. Rather, both intimate and anonymous relationships exist side by side and are interdependent. Face-to-face relationships with a variety of people often serve as the bases for forming more general and anonymous typifications about groups. At the same time, those general typifications serve as the starting points from which to begin to construct the contours of the more individualized types.

In between the anonymity of "others" in general and the intimacy of the face-to-face relationship is the category of generalized types of action and meaning in conduct, e.g., "policemen," "professor," "stock broker," "ship's captain," "barber," "priest," "customer," "salesman." While the particular characteristics any one of these types of actors may possess varies from society to society and within the same society over time, at any given time and place each member of the social order expects others (regardless of which particular other) to behave in a range defined by that role or activity. And, in turn, each individual who undertakes such a role or activity conceives of himself acting in the way generally defined by the "type."

A theme in Schutz to which Natanson does not give sufficient attention is that not only are human actions typified in this manner, but the objects of the social world are equally typified. These latter typifications generally define what a physical object is in various social settings. For example, the sharp-edged object held in one's hand can be either a "weapon" or a "surgical scalpel"; which "name" to assign the object is determined by how sets of actors interpret each other's con-

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duct in a particular circumstance, e.g. as either "thief and victim" or "physician and patient." The meaning of the object is imputed to it from the types of action for which the object is perceived as being used.

If the social world is an intricate web of intersubjective typifications that emerge, are institutionalized through repeated social actions of various forms and are modified and changed as actors assign new meanings to their actions and objects, how does the analyst of *social action* proceed? This is the second major theme in Schutz upon which Natanson focuses his attention.

The Multiple Realities of the Social World

An insight to which Schutz returned in several of his writings was that the social world was one of multiple realities.[12] By this he meant that the meanings assigned to things and the interpretive relationships assignable between objects and actions were open to infinite variety. The young woman standing before two men may be an object of anatomy for one and an object of love for the other. The giants confronting Don Quixote deceived everyone else into believing that they were mere windmills. The measured velocity at which a physicist clocks the movement of one object towards another is the missing son racing to his mother's arms. The moralist's villain whose greed is satisfied at the expense of others is the economist's supplier of an outlawed commodity at a black market price. As Natanson points out, this led Schutz to conclude that "it is meanings of our experiences and not the ontological structures of the objects which constitutes reality," for both actor and analyst in the social world (p. 68). Each of these provinces of meaning, Natanson explains, has its own coherence, and what is compatible and logically meaningful in one may not be in another (p. 72). What are "forces" for the physicist may simultaneously be "intentions" for the sociologist.

For the human actor in the social arena of everyday life, it is the structure of intersubjective meanings, as captured in ideal typifications, that incorporates and envelopes the "reality" of mundane action. The task of the social scientist is successfully to understand that world by comprehending the meanings men see in their actions and in the objects they use. As Schutz expressed it:[13]

> . . . the social world is not essentially structureless. It has a particular meaning and relevance structure for the human beings living, thinking

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> and acting therein. They have preselected and preinterpreted this world by a series of common-sense constructs of the reality of daily life, and it is these thought objects which determine their behavior, define the goal of their action, the means available for attaining them. . . . The thought objects constructed by the social scientists refer to and are founded upon the thought objects constructed by the common-sense thought of man living his every day life among his fellow men. Thus, the constructs used by the social scientists are, so to speak, constructs of the second degree, namely constructs of the constructs made by the actors on the social scene, whose behavior the scientist observes and tries to explain.

In other words, as Max Weber once explained it, what makes the physical transfer of objects among two individuals an act of "exchange" is how each interprets the meaning of his own action and that of the other; and it is correctly understood as an exchange by the social analyst only to the extent that he successfully interprets the set of intentions behind the externally observed behaviors.[14] The social analyst's theoretical mappings of social orders and relationships are, therefore, tracings made on a transparent overlay resting on the social world as he finds it preconstituted with the meanings of men.

Yet while these tracings are derived from social actions, their contours reflect the purposes for which the analyst has drawn them. Jane sees her actions in the department store as concerning whether to buy two shirts for Bob for his birthday instead of only one. On the economist's map upon which her actions are traced, she becomes a demander constrained by limited income, whose choice about which quantity to purchase reflects her responsiveness to alternative market prices and the attractiveness of alternative purchases for which her income could be applied. The concrete individuals and their specific actions are generalized into more universal and anonymous categories and types of conduct through which new social relationships and patterns may be discerned, but which were unseen by the very actors whose behavior conformed to them because of the abstract character of those relationships and patterns (p. 87).

The danger that hovers over the social scientist is that in the process of using and manipulating his abstractions and anonymous categories of action, he may forget that they *are* ultimately derived from the meaningful conduct of the social agents, the understanding of which is the justification and rationale for his theoretical constructions. Economists have, in particular, been susceptible to this: having reduced the multiplicities of human action to a few general "functional forms," the solution to various mathematical problems under conditions of alter-

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native and specified constraints has been the core of economic theorizing for several decades. Almost fifty years ago Schutz understood this danger and reminded economists that "this operating with generalizations and idealizations on a high level of abstraction is . . . nothing but a kind of intellectual shorthand."[15] Alas, for many economists the mathematical shorthand has become the substance of the analysis rather than a medium through which the analysis may be pursued. The world of the mathematical economist has become his own *and only* reality.

The Solution to the Economic Problem

We now have come full circle. Part of the solution to the "economic problem" of how a multitude of individual plans are coordinated in a complex, decentralized system of division of labor should now be clear. It is not necessary that economic agents in particular, or social agents in general, read each other's minds. Instead social participants share a common social world by means of structures of intersubjective meanings. Each is able to anticipate the actions and responses of others with a certain degree of confidence because each sees a similar meaning in various situations, circumstances and relationships. They expect certain types of action and responses from others in various "typical" situations, and they respond with the type of action or deed that others are known to expect from them. These institutionalized typifications serve as what Ludwig M. Lachmann has called the "nodal points of society" for mutual orientation and plan coordination.[16]

The anonymity of these general behavioral typifications is complemented by more specific group and individual "ideal types." These more individual-specific typifications are built up over time by social actors through experiences and interactions with others in the market. Such mental images of the behavioral qualities and characteristics of others in alternative circumstances are the cumulative stocks of personalized knowledge that enable informed and intelligent *indirect* readings of others' minds. What kinds of products, with what kinds of characteristics, do these types of individuals like? How might this type of buyer react to this type of new, neverbefore sold product? What might I typically expect from this income or social group, in terms of quantities they would be willing to buy, if I raised or lowered my price by this amount? What type of sales pitch or salesman-demeanor would most likely gain a sale from different types of buyers? Can I expect the typical response I've come to expect from my rivals when I try to increase my market share?

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Indeed, if buyers and sellers in the market did not possess or could not accumulate this type of knowledge about those they might trade with or compete against, it seems impossible to conceive of how actors could make any rational decisions about what to do in the marketplace, or how rational social action of any kind is possible.

This type of knowledge has nothing to do with statistical probability *per se*. Rather than only trying to anticipate the distribution of future outcomes from a pattern derived from the sequence of past recorded outcomes, one can anticipate the likelihood of specific outcomes from cumulative behavioral knowledge about others, whether a statistical pattern is discernable or not.[17]

And what does this mean for the economic analyst? It means that the "anonymous" categories of "supply," "demand," "market price," and "competitive process" are too often used by economists in a context-less setting. While invaluable shorthands for gleaning out and emphasizing the general and logical relationships underlying "market forces" and "incentive mechanisms," such categories can only be effectively applied in historical interpretation, contemporary analysis, or anticipatory forecasting when enriched and complemented by insight into the "meaning structures" within which the "laws" of economics work themselves out.

This is not to suggest that it is the job—or even that it is within the capacity—of the economist to "predict" the outcomes of the market. Both the particular structures of intersubjective meaning and the individualized typifications of particular persons and groups are to a great extent instances of the type of knowledge of specific circumstances of changing time and place that Hayek and the Austrian economists in general have long contended are beyond the capacity to either centralize or be known by any one mind.[18] But analysis that incorporated the idea and significance of ideal-typification categories in terms of their general and abstract features would enrich both an understanding of the market process and expand the capacity for the type of "pattern prediction" that Hayek has suggested is the only form of forecasting possible, given the complex phenomena of the social and economic worlds.[19]

NOTES

1. Sir Arthur Conan Doyle, *The Complete Sherlock Holmes* (New York: Doubleday, 1972), 472–473.
2. John F. Muth, "Rational Expectations and the Theory of Price Movements" [1961] in *Rational Expectations and Econometric Practice*, ed. Rob-

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ert E. Lucas, Jr. and Thomas J. Sargent (Minneapolis: The University of Minnesota Press, 1921), 4–5; also, David K. H. Begg, *The Rational Expectations Revolution in Macroeconomics* (London: Philip Allan, 1982), 28–31; Steven M. Sheffrin, *Rational Expectations* (Cambridge: Cambridge University Press, 1983), 4–11; Patrick Minford and David Peel, *Rational Expectations and the New Macroeconomics* (Oxford: Martin Robertson, 1983), 4–23; C. L. F. Attfield, D. Demery and N. W. Duck, *Rational Expectations in Macroeconomics* (London: Basil Blackwell, 1985), 11–21.

3. George J. Stigler, "The Economics of Information" [1961] in *Readings in Microeconomics,* ed. William Breit, Harold M. Hochman and Edward Saueracker (St. Louis: Times Mirror/Mosby College Publishing, 1986), 176–185; George J. Stigler, *The Theory of Price,* 4th ed. (New York: MacMillan, 1987), 236–246.
4. Cf. Geoffrey Sampson, *Liberty and Language* (Oxford: Oxford University Press, 1979).
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9. Alfred Schutz and Thomas Luckmann, *The Structures of the Life-World,* vol. I (Evanston: Northwestern University Press, 1972).
10. Helmut R. Wagner, *Alfred Schutz: An Intellectual Biography* (Chicago: University of Chicago Press, 1983); see also my review of the book in *Market Process* (Fall, 1984): 3–5, 15.
11. Gottfried Haberler, "Mises' Private Seminar," *Wirtschaftspolitische Blatter,* no. 4 (1981): 121–126; and Margit von Mises, *My Years with Ludwig von Mises,* 2nd ed. (Cedar Falls, Iowa: Center for Future Education, 1984), 199–210.
12. Schutz, *Collected Papers,* vol. I, 207–259; *Collected Papers,* vol. II, 135–158.
13. Schutz, *Collected Papers,* vol. I, 6.
14. Max Weber, *Critique of Stammler* [1907] (New York: The Free Press, 1977), 109; cf. Ludwig von Mises, *Human Action* (Chicago: Henry Regnery Co., 3rd revised ed., 1966), 26.
15. Schutz, *Collected Papers,* vol. II, 84–85.
16. Ludwig M. Lachmann, *The Legacy of Max Weber* (Berkeley: The Glendessary Press, 1971), 50.

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17. See Richard M. Ebeling, "Toward a Hermeneutical Economics: Expectations, Prices and the Rate of Interpretation in a Theory of the Market Process," in *Subjectivism, Intelligibility and Economic Understanding: Essays in Honor of Ludwig M. Lachmann on His 80th Birthday*, ed. Israel M. Kirzner (New York: New York University Press, 1986), 39–55; and Ebeling, "Expectations and Expectations-Formation in Mises' Theory of the Market Process," in *Man, Economy and Liberty: Essays in Honor of Murray N. Rothbard*, ed. Llwellyn Rockwell and Walter Block (Munich: Philosophia Verlag, forthcoming, 1988).
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Donald J. Boudreaux

MERGER PARANOIA

THE BIGNESS COMPLEX

by Walter Adams and James W. Brock

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Harvard geologist Stephen Jay Gould has pointed out the nineteenth-century Swiss-American naturalist Louis Agassiz's role as the last respectable supporter of pre-Darwinist ideas.[1] Agassiz staunchly opposed the theory of biological evolution, believing it to be contrary to the facts of nature. But in the spirit of modern science Agassiz went to the Galapagos Islands in 1872 to see first hand if Darwin was correct. Agassiz returned from his expedition claiming that he saw nothing to support Darwin's theory.

Agassiz apparently thought that Darwin went to the Galapagos and *saw*—or believed he saw—clear and precise factual records of evolution that are obvious to the most casual observer. Agassiz's failure to see what Darwin must have seen convinced Agassiz that Darwin did a poor job of collecting the facts. But as Gould points out, nothing could be further from the truth. First of all, Darwin was a meticulous observer and recorder of "the facts." More importantly, however, Darwin's theory did not spring from mindless observation of the birds and the bees. Darwin had the concept of evolution before arriving on the Galapagos, and his painstaking observations were done with this concept already in mind. Agassiz, in contrast, examined the biological world with pre-Darwinian concepts. It should be no surprise then

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that, although Agassiz saw the same physical phenomena seen by Darwin, Agassiz's interpretation of what he saw was quite different. Unfortunately for Agassiz—but fortunately for science—Agassiz's fact-finding mission had no effect on the course of biological theory and research.

Economists Walter Adams and James Brock—judging from their book *The Bigness Complex*—are similar to Louis Agassiz. Like him, they attempt to discredit an emerging theory that is radically at odds with an older and one-time-uncontested theory. Furthermore, their attempt involves observations and reports of "the facts" and is not burdened with much theoretical discussion. Also like Agassiz, Adams and Brock genuinely seem to believe that "the facts" as they report them are clear-cut: Adams and Brock are convinced that just one look at these facts would convert everyone except an ideological zealot. The final similarity to Agassiz is that Adams and Brock's assertions are unconvincing.

Adams and Brock are good representatives of the structure/conduct/performance ("SCP") school of industrial-organization economics which, although not as dominant today as it was fifteen or so years ago, remains a major force in the academy and in policy-making arenas. The theme of this review is that the assumptions of SCP theory are not useful for understanding many real-world markets and business practices. Theorists who accept these assumptions uncritically, as do Adams and Brock, thus wrongly interpret many features of reality.

I will briefly summarize SCP theory and then show how it can lead to a host of contradictions, weak theorizing, and bad policy recommendations.

The Structure/Conduct/Performance School[2]

There are three fundamental tenets of SCP theory. The first of these is that *price* competition is all that matters. Any institution, custom, practice, or law that makes price competition more intense is considered beneficial. Such institutions, etc., are called "competitive." Conversely, anything that reduces the pressure on firms to compete with each other by lowering their prices is considered detrimental to social welfare. These latter institutions, etc., are called "monopolistic."

The second tenet is that the intensity of price competition is mechanically determined by the number of (actual and potential) firms in

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an industry. More firms means lower prices; fewer firms means higher prices.

Tenet number three is that economies of scale are empirically insignificant. The few exceptions to this rule are the well-known and easily identified cases of natural monopoly, such as public utilities. In the vast majority of industries, firms do not have to be large, relative to the size of their industry, in order to achieve maximum efficiency and lowest costs.

These three tenets combine to form the core of SCP theory and policy recommendations: The structure of an industry (i.e., the number of actual and potential firms) determines the conduct of firms (i.e., output, pricing, and R&D policies) which, in turn, determine the performance of the industry (i.e., how much consumers benefit from the industry). Large numbers of firms are necessary for maximum consumer welfare because only then are prices driven down and kept as low as possible. If large firms and small firms are equally efficient, breaking up an industry into a greater number of smaller firms improves consumer welfare because the only effect of such a policy of divestiture is to intensify price competition.

SCP theorists see competition strictly as a *disciplinary* device. The task of the firm is (assumed to be) limited to producing the maximum output at the lowest possible cost. But unless firms are subject to vigorous and direct pressure from other firms in their industry, they will produce too little output and sell it at prices that exceed their costs. The purpose of competition—which is provided by large numbers of rival sellers—is to compel firms to lower their prices. I return to this theme later.

Bigness as Badness

The message of *The Bigness Complex* is that bigness is bad. This conclusion rests on unadulterated SCP theory. Adams and Brock's case can be neatly capsulized: When firms are big the number of competitors in an industry is smaller than it would be if firms were smaller. The fewness of competitors shields firms from the necessity of competing. Further, because economies of scale are not prevalent, large size never generates lower costs. Consumers are harmed by bigness because output is lower, and prices higher, than they would be if the industry were composed of a greater number of smaller-sized firms. Adams and Brock propose that large firms be broken up and that all

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activities that lead to large firm size—such as mergers—be prohibited (chapters 10–15 and 27).

This reasoning is much too simplistic. It is the product of theorizing that naively treats counterfactual assumptions made for heuristic purposes as facts rather than as assumptions. SCP theorists have forgotten that assumptions that are valid for heuristic convenience are not necessarily descriptive—or prescriptive.[3]

For example, consider SCP theory's disregard of economies of scale. For large firm size to be unambiguously harmful it is necessary that economies of scale actually be absent in the real world. Only then is there no potential advantage to society in allowing large size to persist. But if we admit the possibility that large size does, in some cases, enable firms to produce at lower costs, the case against bigness is no longer open and shut. If—contrary to SCP assumptions—economies of scale exist, we then must weigh the advantages of improved efficiency resulting from large size against the potential disadvantage of increased monopoly power.

Professor Oliver Williamson analyzed this tradeoff between greater production efficiency and increased potential monopoly power. He found it likely that the advantages to society from the improved efficiency resulting from increased size will, in typical cases, overwhelm the disadvantage of monopoly power even if such power results in higher prices. According to Williamson, "generally it is evident that a relatively modest cost reduction is usually sufficient to offset relatively large price increases" that may result from decreases in the number of firms in an industry.[4] That is, if a merger reduces the number of firms by an amount sufficient to cause price to rise significantly, the merger nonetheless increases net efficiencies in the economy if it simultaneously causes no more than even a small reduction in production costs. Several empirical investigations of the effects of firm size on efficiency have also cast suspicion on the SCP assumption that economies of scale are insignificant. Although this is not the place to argue the strengths and weaknesses of these studies, it is fair to say, at the very least, that the jury is still out on the question of the relationship of firm size to efficiency.

Of course, Adams and Brock are aware that their case against large firm size depends crucially on the assumption that economies of scale seldom exist, so they offer evidence to support this assumption. But the evidence they offer contradicts their other claim that size alone is a source of antisocial monopoly power. For example, Adams and Brock often cite the case of the new "mini-mills" in the steel industry as

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proof that large size and vast integration do not result in greater operating or innovation efficiency. I quote them at length to give the flavor of their argument:

> In such steel products as wire rods, bars, and light structurals, for example, U.S. International Trade Commission evidence showed that it was the intense competition of mini-mills, not imports, that was responsible for the catastrophic loss of market share by the steel giants. It is obvious, said Commissioner Paula Stern, "why the integrated producers lost so much of the market to the mini-mills. The latter are modern and efficient mills dedicated to the production of one or two products. The efficiency of their technology, management, and cost-control techniques enable mini-mills to keep their prices low." According to Commissioner Stern's findings, the average delivered price for wire rod charged by mini-mills "was well below the price paid for rod from integrated firms in most regions and in most of the period of investigation. But even more significant is the fact that these efficient U.S. mills were able to sell wire rod at a price that, on average, was below the average price of imported wire rod." Thus, in 1983 in the Detroit market, mini-mills *under*sold imported wire rod by an average of about $50 per ton (15 percent), while the large integrated companies charged an average of $25 (5.7 percent) *above* that of the imported product. Similar pricing patterns prevailed in other product categories where mini-mills were preeminent. No wonder that mini-mills have prevailed in the market, not only against the domestic steel giants but against such "awesome" rivals as Japan, Inc. (p. 37; original emphasis).

Adams and Brock here stumble into a fundamental contradiction: On one hand they tell us that "enterprises that have grown to gigantic proportions are assured survival—however egregious their lack of vision, judgment, and leadership. . . . [T]he greatest advantage of giant size is an insulation from failure" (p. 289). But on the other hand their evidence showing that large firms aren't necessarily more efficient than small firms simultaneously proves that bigness does *not* necessarily lead to monopoly power. If large size and monopoly power were truly synonymous, the smaller mini-mills would be unable to capture market share from the large steel companies, regardless of relative efficiencies. But, as reported by Adams and Brock, the mini-mills have in fact captured significant shares of the market from their larger rivals. On the basis of this evidence, it is impossible to conclude, as do Adams and Brock, that large size and monopoly power go hand in hand.

The book contains several examples of this contradiction. In discussing conglomerate firms (i.e., companies that produce two or more unrelated products) the authors assert that "an even rudimentary under-

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standing of the anatomy and physiology of conglomerate bigness indicates that the exercise of conglomerate power has a variety of anticompetitive consequences" (p. 185). But elsewhere in the book we learn that "the weight of actual experience shatters the apologetics of conglomerate bigness. . . . For example, officials of three recently divested meat-packing concerns agree that freedom from conglomerate control has been a major factor in their recovery" (p. 44). The passage continues with several quotations from businessmen and academics, all of whom recount actual instances of how conglomerate growth led to reduced profits and, in many cases, voluntary divestitures. By what logic do the authors claim that "conglomerate bigness" is anticompetitive when much of the evidence they cite is of conglomerate firms which are forced by continued losses to abandon their conglomerate form?

It is interesting to speculate why Adams and Brock are oblivious to such a glaring contradiction. One possible reason is their disregard of the principle of marginalism so central to the economic point of view. The question of efficiency as they see it is: What is most efficient, large size or small size? By putting the question this way Adams and Brock overlook the fact that there is a long continuum of sizes from one-person operations to extensive multinational corporations. As firms grow they at first improve their efficiency and then, if growth continues, their efficiency eventually decreases. The optimal size for any particular firm is usually somewhere between a one-man operation and a multinational operation. Firms never make all-or-nothing (nor once-and-for-all) decisions whether to be big or small; instead they decide "at the margin" (and continually) whether to grow, shrink, or remain unchanged.[5] Therefore, when a firm voluntarily reduces its scale or scope of operation we can conclude only that the firm was larg*er* than it should have been and not that large size is generally inefficient in comparison with small size.

Also, because conditions differ from industry to industry—and from firm to firm—the most efficient scale of operation for a specific industry or firm is not the same as the most efficient scale of operation for other industries or firms. Adams and Brock too readily conclude that, because "large" firm size in certain industries is not efficient, "large" firm size is inefficient in all industries. When account is taken of the fact that changes in technology, laws, etc., continually alter economic conditions, it becomes even more hazardous to draw general conclusions from particular cases about the most efficient size of firms. Adams and Brock give no hints that they are aware of these considerations.

Another possible reason for Adams and Brock's failure to recognize

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this contradiction is more fundamental: they take the assumptions of their model too literally. Recall that the nature of SCP theory is to explain the conduct of firms and the performance of markets as consequences solely of industrial structure—i.e., of the number of firms in an industry. But the structure itself is merely *assumed* in SCP theory; it is not explained. (It is an amazing fact that the most influential school of industrial-organization economics has no economic explanation for the structure of industry!)

Economies of Scale

SCP theorists must get by without a theory of industrial structure because of their assumption that economies of scale do not exist. If all firm sizes are equally efficient—as they are by the assumption of no economies of scale—then the competitive forces of the market are indifferent between many firms of small size and a few firms of large size. The assumption that there are no economies of scale is simultaneously an assumption that competition has no role to play in weeding out inefficient firm sizes from efficient sizes. Thus, SCP theorists dismiss from the start the possibility that industrial structure is determined by economic forces. The determinants of industrial structure that *are* admitted into the purview of SCP theorists are confined to a single non-market phenomenon, namely, the ability of firms to merge or collude for no purpose other than to reap monopoly profits. The assumptions of their model hide from Adams and Brock the possibility that the abundant merger and divestiture activity reported throughout their book is the competitive market's way of discovering which particular forms of industrial structure are efficient and which are relatively inefficient. Competition is not only a disciplinary device forcing firms to charge the right price. Competition in fact works on many dimensions in addition to the price dimension. It is a discovery process in which firms of different sizes, producing different products in different ways, challenge each other for the consumer's dollar. Only such multidimensional competition can determine what are in fact the best sizes of firms in different industries at different times.[6]

Adams and Brock's overly narrow view of competition leads them into several other misinterpretations of real-world market phenomena. A few examples are illuminating.

In discussing the U.S. auto industry (p. 69ff) the authors see evidence of monopoly in the fact that "the Big Three" U.S. auto makers

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consistently "ignored warnings of impending fuel shortages" and that "the domestic oligopoly seemed uninterested in engine innovations . . . capable of enhancing fuel economy" (p. 70). The result of these (in)actions was a decline in the fuel efficiency of American-made automobiles. The authors opine that "the principle cause was the increasingly bloated size and weight of the cars the industry elected to produce in its race for styling supremacy . . . [which] artificially inflated automobile gasoline consumption by more than 18 billion gallons between 1950 and 1960" (p. 70). The "oligopolistic effort to protect group profits" led the Big Three "toward ignoring consumer demand and the market, avoiding competition in small cars, and thereby protecting what they perceived as being best for collective, short-run profits" (p. 71). Adams and Brock believe that the performance of the U.S. auto industry would have somehow anticipated the oil shortage were it not so highly concentrated (p. 71).

A more reasonable assessment of the facts shows Adams and Brock's case against the U.S. auto industry to be spurious. First of all, the "race for styling supremacy" is the result of a competitive environment and not, as Adams and Brock intimate, somehow the result of monopoly. Second, it makes no sense for any firm—competitor or monopolist—to ignore obvious opportunities to protect or increase profits. But such blatant ignorance is precisely the charge leveled by Adams and Brock against the Big Three. Improved fuel efficiency, *ceteris paribus,* makes a car more valuable to consumers, which means that consumers are willing to pay higher prices for fuel-efficient cars than they are willing to pay for comparable, but less fuel-efficient, autos. If improved fuel efficiency can be produced without sacrificing many other features of autos that consumers are willing to pay for (e.g., styling, power, comfort), even the most secure monopolist would enthusiastically produce vehicles that get more miles to the gallon. Third, as Henry Manne teaches, the unimpeded trading of corporate stocks tends to ensure that no firm's best interest is served by protecting or enhancing short-run profits if such actions diminish long-run profitability.[7] Managers who trade long-run for short-run profits will find the price of their company's stock falling. This fall in price occurs because most investors are unwilling to pay to be owners of a firm with a bleak future. But the falling price is a signal to entrepreneurs that the capital of the firm is not being utilized in the best way possible. Entrepreneurs who read the signal this way have every incentive to acquire a large enough chunk of the under-priced stock so that they can oust the incompetent incumbent managers and replace them

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with managers who are more concerned with the long-run profitability of the company. If managers value their jobs, it is unlikely that they will intentionally sacrifice long-run profitability for short-run gains.

Adams and Brock's hand-wringing about oligopoly does not constitute a sensible explanation of why U.S. auto makers hesitated before entering the small-car market.[8] We must look beyond "the oligopolistic structure of the industry" for such an explanation. The only plausible reason for this hesitancy is that the auto makers judged that consumers would regret the necessary loss of low price, size, styling, and power more than they would value additional fuel efficiency. This judgment turned out to be wrong in the 1970s. But instances of bad judgment are not evidence of monopoly power. Surely, if GM, Ford, and Chrysler knew then what they know now, they would have made different decisions just prior to the oil crisis.

The Bigness Complex consistently construes unprofitable business decisions as evidence of monopoly power. However, imperfect decisions are evidence only of imperfect decisionmakers in an uncertain world. Given that bad decisions are inevitable in reality, a crucial task of competition is to expose these decisions as quickly as possible so that resources are not tied up in the production of commodities that no one wants. The sensible conclusion to be drawn from Adams and Brock's examples of unprofitable decisions—which were seized on by, for instance, Japanese competitors—is that competition is vigorous rather than absent. (It is worth noting that just because bad decisions never occur under "competition" as defined by SCP theory [which assumes perfect knowledge] does not mean that bad decisions never occur in the competitive markets of the real world.)

Adams and Brock's discussion of the auto industry contains more inconsistencies between the evidence presented and the "oligopolistic" conclusions drawn. On page 72 Adams and Brock tell us that

> General Motors, Ford, and Chrysler each seemed to recognize that vigorous entry into small cars by any one of them would trigger entry into the field by others. Further, each firm seemed to believe that the demand for small cars was not large enough to permit profits acceptable to the group if all of them should enter this segment of the market.

Adams and Brock are here saying that, because there were not enough profits for all three firms to enter the small-car market, they all stayed out. But this conduct is opposite that which would occur if Adams and Brock's accusations of oligopolistic collusion were true. If GM, Ford, and Chrysler were engaged in *successful* collusion, and if

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the small-car market were perceived as profitable for one or two entrants but not for all three, then group profits would be increased by an agreement allowing, say, only one of the firms to enter, while the others stay out. The additional profits earned by the single entrant could then be shared by all three conspirators. The two firms that agreed not to enter the small-car market would have no incentive to violate the agreement because such entry would (by assumption) reduce group profits to zero. Therefore, if successful collusion did indeed characterize the U.S. auto industry, the fact that small cars were not produced is evidence only that all three firms agreed that small cars were not likely to be profitable. If, however, we assume that all firms knew that the production of some quantity of small cars was profitable, the fact that entry into the small-car market did not occur indicates that the Big Three were not engaged in successful collusion against consumers. Adams and Brock cannot validly assume that small-car production was known to be profitable and also insist that because the Big Three failed to produce many small cars, they were successfully colluding against the consuming public.

The same illogic marks Adams and Brock's discussion of vertical mergers (e.g., mergers of manufacturers and wholesalers). Consider the following statement:

> Whatever its hypothetical benefits, vertical integration entails both private and social costs. A steel company that has captive coal or iron-ore mines feels constrained to patronize its in-house suppliers instead of "playing the market." It thus forsakes the opportunity of buying its raw materials at a lower price from unaffiliated sources. An integrated oil company is tempted to use its own crude for refinery operations even when it may be advantageous to enter the world spot market for crude. In short, as long as markets are reasonably competitive, the ownership of natural resources (or retail outlets, at the other end of the vertical chain) may be a private albatross without socially redeeming virtues. . . . It is quite proper, therefore, that public policy protect markets from subversion by vertical mergers . . . (pp. 181–182).

But *why* would a profit-seeking firm feel "constrained to patronize its in-house suppliers" if the same supplies could be purchased elsewhere at a lower price? That is, why would a firm knowingly forego profits? If a firm purchases a supplier only to discover later that identical supplies can be acquired cheaper from outside sources, it is in the firm's economic interest to acquire its supplies by "playing the market" and selling off its supplier. A firm does not have to be told by Con-

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gress or the courts to take actions that are in its best interest—unless Adams and Brock wish to impute non-economic motives to management, for which they present no evidence. Indeed, the voluntary divestitures that Adams and Brock point to throughout their book are evidence that firms do not gratuitously maintain unprofitable operating divisions.

As with their analyses of large firm size, conglomerate mergers, and industries with only a few firms, Adams and Brock are befuddled by the question of why vertical mergers occur in the first place. Because such mergers do not exist in the "competitive" world as defined by SCP theory, Adams and Brock can see vertical mergers only as monopolistic. Thus, the possibility that a firm can increase its efficiency by merging with a supplier or with a buyer is never mentioned by Adams and Brock because the real-world conditions that give rise to such mergers are assumed away.

Consider, however, the following example. Suppose a computer manufacturer produces 1,000,000 units of a particular type of computer every year. Further suppose that the guts of this computer, when completely assembled, are housed in a particular type of metal casing designed to protect the circuitry during its years of use. The metal casing is an input into the final product ("computer"); consumers purchase the entire package, guts *and* casing. Because this particular computer manufacturer is the only user of the precise type of metal casings that house its circuitry, the computer manufacturer cannot just go to the store to buy 1,000,000 metal casings with the correct specifications. Instead, some other method of acquiring these metal casings must be found. Suppose that this other method takes the following form: Every year a firm specializing in the production of metal casings agrees to produce 1,000,000 metal cases of the exact specifications required by the computer manufacturer in return for the computer-manufacturer's agreement to purchase them at a certain price.

Although this contractual agreement is in the best interest of both firms, it may not be stable over time. For instance, once the contract is signed, the computer manufacturer produces the electronic guts of the computers expecting delivery of the metal casings on a certain date. What recourse is available to the computer manufacturer if the casing maker claims, just before the casings are to be delivered, that because of unexpectedly high labor costs he must be paid a higher price for his casings or he will not be able to fulfill his part of the contract? Without the metal casings the computer manufacturer is unable to ship his final product to retailers and he thus loses sales to competing computer

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producers. Because no other casing maker produces casings of the exact type needed, the computer manufacturer may be at the supplier's mercy. In practice, moreover, legal recourse is often unfeasible in such situations, for reasons of cost, time and the ambiguities of complex contracts when interpreted by the courts.

Fortunately, relying on contracts between firms at different stages of the production process is not the only way to coordinate successive stages of production. Mergers make it unlikely that the supplying firm will intentionally deceive the buying firm in an attempt to increase its short-run profits. With the two stages of production owned by the same firm, nothing can be gained by such a tactic. And consumers may benefit because the impetus behind the merger is to lower the overall costs of doing business by eliminating some contracting costs that characterized the pre-merger situation.

But Adams and Brock are blind to the possibility that mergers can improve efficiency by reducing costs or by ousting inferior management in favor of better managers. The source of their blindness is apparent when they argue that

> the current merger wave is clearly out of control. Billion-dollar megacorporations are roaming the Darwinian jungle, making helter-skelter acquisitions or merging with one another. . . . They do not result in the creation of *real* values, the building of *new* factories, the development of *new* products or processes, or the employment of *new* workers. The vast majority of these magamergers are a form of paper entrepreneurialism, a means of reshuffling *existing* assets, an exercise in financial razzle-dazzle that benefits the merger midwives of Wall Street . . . but not the American economy (p. 372; original emphasis).

To argue that mergers are "unproductive at best" if they create nothing tangible is to commit the most naive sort of physicalist fallacy. Physical things do not have to be created in order for economic activity to be productive. Any exchange of property rights that moves resources from less valued uses to more highly valued uses improves the welfare of society despite the fact that no new physical goods or services are created as a direct result. Would Adams and Brock argue that voluntary trades of players between baseball teams are unproductive? After all, no new baseball players are created when a trade is completed. Although not all trades—or mergers—turn out as expected, clearly no trade takes place unless it is in the perceived interest of *both* teams to swap players. Economists say that voluntary trades of private property rights are "positive-sum" transactions because both parties

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are made better off. In the above computer example, the merger reduced contracting costs. Even though it did not create any new computers, circuitry, metal casings, or physical equipment, the merger surely must be reckoned as productive.

As another example, suppose I own a taxi cab. The value of the cab to me is determined by how much profit I am able to earn with the cab over its productive life. But also suppose that I find taxi driving boring or I don't know my way around, such that I don't work long hours and don't get big tips. It follows that the cab is less valuable to me than it is to a more industrious or competent taxi driver. Such a driver will be able to buy the cab from me at a price that we both find appealing (because he can offer a price for a cab that exceeds the amount by which I value it). The title to the cab is thus transferred from me to the more industrious driver by voluntary exchange. The transfer of ownership of the cab clearly creates value, despite the fact that no new cab is produced, because the cab is now owned by someone who is a better taxi driver than I.

If the buyer in the above example were a taxi-cab firm rather than a single individual, the essence of the case is unchanged: the cab is transferred from an inefficient owner to a relatively efficient owner, with no new cabs created in the process. But what do we call it when a taxi-cab firm purchases the assets of another cab operator? We call it a merger. My point here is not to defend all mergers (though I am willing to go a long way in that direction), but to show that "paper entrepreneurialism," whether it involves small or large firms, is often very productive for producers as well as for consumers.[9]

The Price Complex

The most fundamental problem with *The Bigness Complex* is one that it shares with a good deal of twentieth-century industrial-organization theory and policy: it is obsessed with current-period prices. Any activity that does not lead directly and swiftly to a money-price decrease is considered monopolistic, while the term "competition" is reserved only for activities that lead directly and swiftly to price decreases.[10]

Price is the crucial variable to be determined in the SCP model; therefore, changes in costs, changes in consumer tastes, differences in product qualities and production technologies among firms, and so on, are assumed away so that the focus on price is as clear as possible.

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That is, all forms of non-price rivalry between firms are ignored in order to examine one particular form of rivalry, namely, price competition. There is nothing objectionable about this practice *per se*. But Adams and Brock and their fellow SCP theorists have somehow gotten trapped into believing that, because economic theory pays the lion's share of its attention to the determination of prices, competition that results in lower prices is all that is desirable in reality. Competition comes exclusively to mean *price* competition. Adams and Brock are thus oblivious to the competitive forces that cause changes, not in money prices directly, but in non-price phenomena such as industrial structure or product mix. The flip side of this oblivion is the knee-jerk interpretation of all changes other than price declines (e.g., mergers) as monopolistic.

Prices are in fact only one element of the full product that firms offer to consumers. What matters to consumers is the full array of product qualities, not just money price. There is no denying that low price—and, hence, price competition—is *desirable,* but in our world of uncertainty and imperfections it is silly to presume that the only important task for an economy to perform is to get and keep prices as low as possible. This presumption would be correct only if all "non-price" economic problems were already solved. However, in addition to discovering and enforcing correct prices, real-world economies must also discover and enforce

—the particular mix of products to produce
—the particular array of product characteristics such as quality and style
—the least-cost methods of producing and distributing these products
—feasible contracting arrangements that protect against unforeseen contingencies.

This list is only suggestive of the multitude of different non-price tasks facing all real-world economies. Performance of these tasks is not a free good; to get more of one, society must sacrifice some amount of the others.

It is useful here to think of competition as operating on two levels. Price competition is the first level. This is competition among producers of *given and fixed* goods and services. If we assume that all variables other than money prices are given and fixed, competitive pressures are vented only in price reductions. By making such an assumption we are better able to isolate the forces working to determine prices. However, notice that when goods and services are fixed in all dimensions other

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than money price, consumers sacrifice nothing when prices are reduced. Price decreases are always socially beneficial under the assumptions of fixed goods and services.

At the second level is what I call "full-product competition." Full-product competition is more general than price competition; it is competition among producers involving not only reductions in money prices but improvements in the many other (i.e., non-price) characteristics of products. Analyses of full-product competition differ from analyses of price competition by not making the counterfactual assumption that the non-price characteristics of goods and services are given and fixed. Competitive pressures are then recognized as having *two* vents: price reductions and product improvements. When theorists and policy makers realize that competition affects every aspect of a product and not just its money price, it is no longer clear, without additional information, that a price increase is harmful to consumers or that a price decrease is beneficial. Just as the standard theory of price competition shows how we must rely on competitive forces to discover and enforce "correct" prices, a more general theory of full-product competition would explain how competitive forces are required to discover and enforce the correct product characteristics, the correct ways of doing business, and the whole multitude of other details that must somehow be selected in the real world.

The challenge facing economists now is to develop more fully a theory explaining competition's role as a force affecting *all* aspects of the economy and not just the money prices of goods and services. Economists have made great strides in this direction since the 1960s. This healthy trend is especially evident in the pages of *The Journal of Law and Economics* and in the works of economists such as Armen Alchian, Robert Bork, Yale Brozen, Ronald Coase, Harold Demsetz, John McGee, Richard Posner, Oliver Williamson, members of the Austrian school, and several other outstanding scholars who are not blinded by the assumptions of SCP theory.[11]

It is ironic that Adams and Brock disdainfully refer to this group of thinkers as "neo-Darwinists" (p. 364). This disdain stems from Adams and Brock's complete misunderstanding of the new body of assumptions and concepts these thinkers are developing. Refusing to open their minds to an approach that differs from what they presumably learned in graduate school, Adams and Brock feebly try to defend SCP theory (and active antitrust policy) in much the same way that Louis Agassiz tried to defend creationism. If those who depart from the

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structure/conduct/performance school are neo-Darwinians, it may be only in the sense that Adams and Brock are neo-Agassizians.

NOTES

1. Stephen Jay Gould, *Hen's Teeth and Horses' Toes* (New York: W. W. Norton, 1983).
2. Until the influence of the Chicago and UCLA schools was first felt in the 1970s, SCP theory was synonymous with industrial-organization theory and antitrust analysis. The SCP school originated at Harvard in the 1930s with the work of Edwin Mason, a law professor, and his student Joe Bain. Today, prominent members of the SCP school include Richard Caves, Steven Salop, Richard Schmalensee, and F. M. Scherer.
3. Louis DeAlessi's criticism of economists in general applies to SCP theorists: "When the theory is applied to particular circumstances . . . the variables describing those circumstances must be related to empirical entities and taken into account. This requirement was seldom observed . . . because economists confused the assumptions . . . that define a particular spatiotemporal domain of the theory with the assumptions that define the theory's initial hypotheses." Louis DeAlessi, "Nature and Methodological Foundations of Some Recent Extensions of Economic Theory," in *Economic Imperialism,* ed. Gerard Radnitzky and Peter Bernholz (New York: Paragon House Publishers, 1987), 51–76.
4. Oliver E. Williamson, "Economies as an Antitrust Defense: The Welfare Tradeoffs," *American Economic Review* 58 (March 1968): 18–36.
5. The classic work on the theory of firm size and integration is Ronald H. Coase, "The Nature of the Firm," *Economica* 4 (1937): 386–405. Adams and Brock do not cite this article.
6. There are several outstanding discussions of what F. A. Hayek calls "competition as a discovery procedure." A recent contribution is found in Gerald P. O'Driscoll and Mario J. Rizzo, *The Economics of Time and Ignorance* (New York: Basil Blackwell, 1985), chs. 6 and 7.
7. Henry Manne, "Mergers and the Market for Corporate Control," *Journal of Political Economy* 73 (April 1965): 110–120.
8. It is not true that U.S. auto makers avoided the small-car market prior to the energy crisis. The "Big Three" each produced small cars in the early and mid-1960s: Ford had the Falcon, Chrysler the Valiant, and GM the Corvair. These models were not financially successful. Also, the "Crosley" was produced during the early 1950s by an independent firm. The Crosley was a compact car—it sported wheels only 12 inches in diameter—but it did not sell well, either.
9. Evidence shows that the recent merger activity has not created profits only for a few while harming society at large. See, e.g., David L. Pry-

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chitko, "Corporate Takeovers and Shareholder Interests," Citizens for a Sound Economy, *Issue Alert* No. 13 (April 1987).

10. I am not suggesting that SCP theorists are always correct in their assessments of whether or not a specific activity will lead to a price decrease. In fact, they are often wrong. But for purposes of this review I assume that such assessments are always correct.
11. See, e.g., Alchian, *Economic Forces at Work* (Indianapolis: Liberty Press, 1977); Dominick T. Armentano, *Antitrust and Monopoly* (New York: John Wiley, 1982); Bork, *The Antitrust Paradox* (New York; Basic Books, 1978); Brozen, *Concentration, Mergers, and Public Policy* (New York: Macmillan, 1982); Demsetz, *Economic, Legal, and Political Dimensions of Competition* (Amsterdam: North-Holland, 1982); Jack C. High, *Maximizing, Action, and Market Adjustment* (Munich: Philosophia Verlag, forthcoming); Israel M. Kirzner, *Competition and Entrepreneurship* (Chicago: University of Chicago Press, 1973); McGee, *In Defense of Industrial Concentration* (New York: Praeger, 1971); Posner, *Antitrust Law* (Chicago: University of Chicago Press, 1976); Williamson, *The Economic Institutions of Capitalism* (New York: The Free Press, 1985).

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Richard E. Vatz and Lee S. Weinberg

TRIVIALIZING ANTI-PSYCHIATRY

THE MYTH OF NEUROSIS: OVERCOMING THE ILLNESS EXCUSE

by Garth Wood

New York: Harper and Row, 1986. 294 pp., $15.45, $7.95 paper

For a generation institutional psychiatry has relied on the unquestioning and compliant print and electronic media to send the public consistent messages about "mental illness": mental "diseases" affect upwards of 25% of the population and can strike anyone and any family; they are a major cause of crime; and most generally (and most persistently), "mental illness" is "our nation's number one health problem." Yet, during this same period, there has been vigorous and increasing dissent from this point of view, led by Dr. Thomas Szasz. The title of his seminal work, *The Myth of Mental Illness* (1960), aptly summarizes his view of the above contentions regarding institutional psychiatry.

A brief overview of the current status of the Szasz-psychiatry struggle is necessary to provide perspective for evaluating Garth Wood's *The Myth of Neurosis.*

In her excellent book *Illness as Metaphor,* Susan Sontag makes the profoundly true, if not profound, observation that "there is an increasing tendency to call any situation one disapproves of a disease." Today many, if not most, of those in the "mental health" professions are willing to call practically any deviant or even excessive behavior an "illness" or an "addiction," including not just violent crime, alcohol consumption and gambling, but also jogging, sex, work, eating, and endless others.

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The aforementioned behavioral "illnesses" are seen as medical problems despite the lack of evidence of any pathology. To deal with that contradiction, many physicians argue that "illness" may refer to behavior that is irrational or does not conduce to a well-functioning human being. One defender of the use of the word "illness" to describe "what the patient is and does or is not and cannot do," psychiatrist Ronald Pies, writes simply that "the criteria of disease have *always* been in dispute."

The Manufacture of Madness

The problems with such an elastic definition of illness are that it provides potentially for *all* human behavior to be seen as "ill" if carried to "excess," it deludes the public—which thinks that when doctors are discussing "disease," they mean a biological problem (lesions, altered chemistry, etc.)—and it provides for the avoidance of moral and/or legal responsibility when these "illnesses" of behavior are said to reflect "irrationality" or a "lack of control." Moreover, irrationality is not medically diagnosable—like beauty, it often is in the eye of the beholder—and ability to "control" one's behavior can be inferred only from the claims of the "patient."

Thus, the general public is a willing, quiescent audience for the mystifying application of medical rhetoric to non-medical behaviors. Adding further to the public's willingness to suspend disbelief on the issue of "mental illness" is simple incredulity that normal, healthy people could act so strangely or ruin their lives so badly. Thus, in lay language "illness" has come to be used as a descriptive term located on a "good-bad" continuum: the more horrible something is, the more likely that people will call it a "sickness." The Nazis were "sick." Nuclear war is "sick." John Hinckley is "sick."

For over thirty years Thomas Szasz has been warning that the abuses of psychiatry have increased exponentially, to the point that in many countries it has become one of the primary components of social control. He argues as well that institutional psychiatry in America has mystified so many people that we are in danger of seeing the evolution of a *Therapeutic State* in which psychiatry or some new form of the current governmentally supported mental health structure would be the main and the ultimate source of social control: omnipresent, yet acceptable to the majority of people, since its norms of acceptable behavior would by definition be the behavior of the

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majority. In such a state non-conforming behavior seen as "sick" could properly be interfered with (voluntarily or involuntarily), since the goal would be "health," an unquestioned good, and the practitioners of this art of "diagnosing" and "healing" "sick" behavior would benefit from the unquestioned ethos of the medical scientist. In fact, Szaszian warnings have provided a rhetoric which may have already foiled his prophesy concerning the emergence of a total therapeutic state.

Szasz argues that much of what we call "mental illness" has no relation to illness; instead, it is simply a label used primarily for two purposes: one, to *discredit* behavior about which we have little understanding or much disdain or contempt, and two, to *accredit* those whose behavior(s) are socially acceptable as well as those who diagnose the unacceptable as being "sick."

Many neuropsychiatrists grant that there is little or no evidence for actual illness to account for the broad array of behaviors that are labelled "mental illnesses." Many of these same psychiatrists counter, however, that over the last ten years or so discoveries have been made with respect to affective disorders and schizophrenia that demonstrate the correlation and the possible causal relationship between physiological and biochemical abnormalities and these "mental disorders." Various studies of neurotransmitter imbalances as well as endorphin deficiencies and excesses have led to claims of new proof of real mental *disease* and cure, especially in these areas of affect and behavior. However, even if all the claims of the neuropsychiatrists were true concerning revolutionary advances in discovering chemical imbalances in a small percentage of "mental patients'" brains, it would leave unaffected the thrust of Szasz's claim that "mental illness" is a myth, as well as his condemnation of the use of such diagnoses to deprive people of their civil rights and political freedoms.

The Myth of Mental Illness vs. the Myth of Neurosis

Wood's popular effort, unfortunately, while rejecting both psychotherapy and medicobiology, adds little to this ongoing debate. His conceptual distinctions between illness and unhappiness are muddled and his apparent respect for psychiatrists and psychologists (whom he repeatedly treats as apparently interchangeable) seems inconsistent with his argument. He does offer some common sense advice on how to deal with "problems in living," but for every good idea in the book

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Wood is indebted to Szasz. Despite the inexplicable and indefensible absence of a single acknowledgement of this debt, Szasz should be unconcerned, for the integrity of virtually every idea is eviscerated by inconsistencies and a host of other conceptual muddles in Wood's arguments. Wood inveighs against psychiatric diagnosis, calling it an "inexact and unrewarding art" (p. 43), yet he blithely and repeatedly expresses the caveat, when advising people on how to deal with their problems, that they should first ensure that "psychological illness [has] been excluded by a competent doctor" (p. 24). Wood has written a book with pretensions to seriously challenge the psychiatric profession, but he accepts the premise that "mental illness" is a coherent concept. This dooms his effort to failure.

Wood's central thesis is that mental illness *does* exist and that the problem is how to separate actual mental illness from mere unhappiness. Thus, he seeks to limit psychiatry to "genuine disease" (p. 2). Wood acknowledges without much explanation that "those who are physically or psychologically ill should be referred immediately to a specialist in these fields" (p. 26). A person whose problem is not mental illness, but only that "he is not functioning particularly well and is not gaining satisfaction from his life" (p. 27) should not come under the care of psychiatrists or psychologists; such a person should undergo what Wood terms "Moral Therapy." Precisely who is properly trained to conduct such therapy or why he continues to use the medical sounding term "therapy" are left unclear.

The style of the book is provocative, but the message is far less so. For example, Wood writes of psychiatrists: "These misguided mythmakers have encouraged us to believe that the infinite mysteries of the mind are as amenable to their professed expertise as plumbing. . . . This is rubbish" (p. 2). But his attack is severely limited in scope. He accepts the existence of "schizophrenia" and "depression" as illnesses which are sufficiently discrete for medical doctors to identify. He goes so far as to argue without evidence that "in the large majority of cases the recognition of psychiatric disease is not at all complicated, and in nine out of ten cases psychiatrists will agree on diagnosis" (p. 29), apparently confusing consensus with validity. His use of the term mental "disease" seems to go even further toward accepting the traditional medical model than the American Psychiatric Association, which uses only the term mental "disorder" in its diagnostic manual; his confidence in psychiatric diagnosis at certain (but not all) points in his book probably exceeds even that of many practicing psychiatrists. He disputes "neurosis" as a concept, but has no trouble with other conven-

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tional psychiatric terms like "sociopath" or even "mental health." For all his claims regarding psychiatry's "pretentious nonsense" (p. 3), Wood demonstrates in not very subtle ways that he is at heart an admirer. Psychiatry finally has a critic about whom its defenders can reasonably say that his critique is "only semantics," and inconsistent semantics at that.

Wood's book revolves around his claim that real mental illnesses must be identified and treated by psychiatrists, while various neuroses should not. But this is the weakest conceptual part of his work. In his "Layman's Guide to Psychiatric Diagnosis" (p. 214) and in his creation of three categories to separate real from mythical illnesses, Wood continually distinguishes without explanation or evidence which behaviors represent illnesses and which do not. His categories include: "genuine psychiatric illnesses" (schizophrenia, mania, depression, compulsions, eating disorders, and clinical anxiety); conditions better treated by physicians (dementia, delirium, and subnormality); and conditions now considered "within the rightful province of psychiatry"[1] which "do not represent true psychological illness" (p. 36) (personality disorders, hysteria, drug and alcohol abuse, sexual dysfunctions, sociopathy and psychopathy).

Typical of Wood's conceptual confusion is his treatment of alcoholism. While indicating that it is not an illness, he points to studies which strongly suggest the existence of a genetic predisposition toward alcoholism (p. 41) and that such people may be "unable or unwilling" to stop themselves from drinking. If alcoholics are genetically or volitionally impaired, however, their exclusion from the ranks of the truly sick makes no sense. His distinctions simply are not based on any criteria sufficiently precise to permit the differentiation of behaviors so as to label some "sick" and some "not sick."

"Moral Therapy"

The advice offered to those who somehow are determined not to need psychiatry or psychology is to undergo what Wood calls "Moral Therapy."

If Wood is confused about what he thinks regarding mental illness, he is in an even worse conceptual mess regarding his psychological panacea, Moral Therapy. Moral Therapy, says Wood, is a philosophy based not on "pseudo-intellectual gymnastics, nor on a naive reliance on chemistry to provide the soma for a brave new world, but on common

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sense, on what we know in our hearts" (p. 4). Wood's conception of Moral Therapy, however, promotes irresponsible behavior, is hopelessly mired in contradictions, and abounds in banalities—e.g., one "must learn to deal with the person he is and the problems he has before he *can become the person he feels he should be*" (p. 141); "In Moral Therapy, then, every day will be considered an opportunity for a new beginning, while every yesterday will be consigned without ceremony to the scrapheap of history" (p. 140); and "every individual has the necessary equipment for leading a successful and contented life" (p. 152). Wood's endlessly repeated major tenet is that if a person is true to his own moral or value system, no matter what that value system is, he is "mentally healthy" (p. 53)—as long, however, as it is his "true code," (p. 147), which only the Moral Therapist may be able to discern. So Wood argues that for the case of the "terrorist" who is a sincere "idealist" the Moral Therapist would have to admit that this particular individual would "best preserve his personal psychological equilibrium by engaging in those violent activities in which he so passionately believes." Wood argues that this honors the "Nuremberg factor" by requiring that we follow "the commands of our own unique ethical systems wherever they may lead us" (p. 145). It apparently never occurs to Wood that a "Nuremberg factor" consideration might require a Moral Therapist to take responsibility for condoning terrorism. But this is merely one egregious fatuity in a book replete with them.

This brings Wood to an even more absurd tenet of his Moral Therapy: that in making decisions, the primary criterion should be "the search for personal difficulty" (p. 160)—even gratuitous difficulty. Thus, on the issue of whether to stay in bed a few extra minutes, Wood says the "workaholic" who is raring to go should stay in bed, but the lazy person should not. On the other hand, cautions Wood, one ought to avoid at almost all costs "guilt," the feeling which will always tell you that you are doing something inappropriate. "Guilt doesn't lie" (p. 148). "If sex makes her feel guilty she should give it up" (pp. 203–204). The guilt criterion supercedes the "difficulty" measure. So if you feel the need to punch someone (Wood's example), "the turning of the other cheek would certainly be more difficult, but it would not be *appropriate* [to turn the other cheek] . . ." (p. 161; emphasis in original). But then both the criteria of difficulty and guilt are superseded by the criterion of sociopathy, so before recommending to this individual that he or she punch someone, "we should ask ourselves whether or not we are dealing with a sociopath . . . (p. 161). Thus, Wood's circle is completed by a reference to a vague and conventional psychiatric category.

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Even the basic values Wood attributes to Moral Therapy, which he says reflect a "conservative philosophy" (p. 58), are violated by his own suggestions. Wood ostensibly supports the assumption of personal responsibility for one's actions and throughout claims a rejection of therapeutic paternalism. At the same time he supports the Moral Therapist's refusal to allow certain behaviors in people especially if their self-justifications are "casuistry" (p. 201). But the Moral Therapist's evaluation of the client's rationales for behavior does not distinguish him from the psychiatrists whom Wood criticizes. Just like the psychiatrist, the Moral Therapist's "only concern is the mental health of the individual" (p. 201).

Garth Wood's *The Myth of Neurosis* deals with serious issues and steals some ideas from serious people, but seriousness is not served well either by the author or the book.

NOTE

1. Note the peculiar juxtapositioning of "psychiatry" and "psychological illness."

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Chris Sciabarra

THE CRISIS OF LIBERTARIAN DUALISM

There is a spectre haunting modern libertarian thought that is deeply rooted in its dualistic methodological presuppositions.

Dualism posits the existence of two mutually irreconcilable principles in social reality. Libertarian dualism sees conflict, relations of antagonism and struggle between the political and the economic spheres, between the state and the market. Methodologically, it emphasizes the differences between them, rather than the similarities; disjunction and intervention rather than inter-relationships. The dualistic assumptions of the theory lead to an analysis which tends to be highly abstract, paving the way for policy prescriptions which are equally one-dimensional.

This thesis is stated rather boldly, but it is, nonetheless, one of the underlying propositions being debated in the pages of CRITICAL REVIEW. This essay suggests that recent articles in this journal have pointed to a potentially devastating crisis for modern liberal and libertarian theory. It is a problem which provides an excellent opportunity for fruitful dialogue among divergent schools of thought.

Dualistic methodology is not merely a liberal derivative. It plagues certain economistic and deterministic readings of Marx and is, in fact, the basis of the modern-day notion that the state can plan society's road to the millennium. While libertarians are deeply critical of the practical possibility of a future socialist Garden of Eden, their policy prescrip-

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tions for the privatization and absorption of governmental functions into the market process is the other side of the same dualistic coin. A choice between a socialized Garden of Eden and a privatized Disneyland is a choice between rival utopian ideals.[1] Before examining libertarian dualism, this paper will contrast two basic conceptions of social reality. The first is atomistic, based on mechanistic, external relations, while the second is organicist, based on holistic, internal relations. We will look briefly at dualistic-dialectical methodological disputes on the socialist left, and proceed to an examination of dualism as expressed by libertarian theorists.

Atomism vs. Organicism

Theories offer us complex conceptual formations with which to interpret the world. The concepts used by social theory are inherently relational because they help us to see the relationships between seemingly disconnected things. There are two basic theories of social relationships. The first approach can be defined as a doctrine of strict atomism. Our view of the world can be subdivided and reduced to a mere description of things. All relationships between these separable and isolable things are necessarily external. This suggests that the world is constituted by elements which are strictly independent of one another.

The second approach can be defined as a "doctrine of strict organicity."[2] In this instance, the interdependence of social reality makes it impossible to examine any part of existence without taking into account *every* part of existence. Since everything must be known before anything can be analyzed, this position affirms that no elements are isolable in principle, and that all elements are constitutive of a whole within which each of them is internally related to and dependent on the other.[3]

Admittedly, the conceptualization of these two extreme positions is itself a "dualistic" exercise, since it seems to suggest that there is no middle ground between organicity and atomism. Strict organicity sees the whole as greater than the sum of its parts. Its reliance on aggregative analysis tends to obscure individual elements as they are completely absorbed and determined by holistic categories of explanation. Epistemologically, organicist integration offers no criteria by which to identify those core relations which may be essential to the definition of the whole under scrutiny. Strict organicity fails to define these core

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relations because it ultimately depends on omniscience. But since our knowledge is in reality open-ended, and never "complete," our understanding of a whole can never be truly validated as adequate.

By contrast, strict atomism sees the whole as the additive sum of ever-smaller constituents. The problem here is that the more remote and microscopic our analysis becomes, the greater is the chance that we will be unable to grasp the interactions of the parts. For example, seeing an individual human being as nothing more than a physiological and chemical mass of cells makes it difficult to define man's "essential" characteristics qua man. Atomism, then, tends to define a whole in reductive terms. It multiplies the number of objects in our inquiry by "atomistically" separating and isolating elements in the whole that may, in fact, reciprocally presuppose each other.

Dualistic methodology goes beyond strict atomism, but it is inspired by an atomistic worldview. Dualism attempts to identify and separate two "irreconcilable" spheres of social reality, though it often gives ontological priority to one sphere over the other.[4] Sociologically, the state and the market may interact but they are conceptually and historically separable in the dualistic model.

We will consider two forms of dualism. The first is "socialist dualism" which in political practice gives ontological priority to the state apparatus. It views the state as an instrument to mechanistically crush the "exploitative" operations of the market. It suggests that the market needs the "bourgeois" state to survive, but that the "proletarian" state can absorb the sphere of social production and transcend bourgeois "exploitation."

The second form of dualism we define as "libertarian." This model gives ontological priority to the market. It views the state as an external, "coercive" intrusion into the market and its coordinative capacities. The state is a dependent variable; it presupposes some form of material production from which it can expropriate wealth for its survival. The market can exist without the state, but the state cannot exist without the market.

Dialectics vs. Dualism

While dualistic method is inspired by atomism, non-dualistic—or "dialectical"—method is inspired by organicity. Such a methodology is rooted in organicity because it is concerned primarily with integrative relationships. It transcends strict organicity, however, because

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it defines historically specific "wholes" rather than holistic, trans-historical abstractions. A historically specific whole is one which does not depend on a transcendental identification of the whole under scrutiny. The definition is contextual: the internal relations which are identified are determined contextually and may be altered with the growth of knowledge.

Ultimately, the atomism-organicism, dualist-dialectical distinctions offer different modes of sociological perception. A theory of perception, writes David Kelley, must take into account the principle that "the object appears in a way that is relative to the means by which we perceive it."[5] Similarly, different means of perceiving social reality help us to draw differing connections—or "boundaries"—between and among the constituent elements that exist. Bertell Ollman and Edward Vernoff maintain that "however great the influence of what the world is on how we draw the boundaries, it is ultimately we who draw the boundaries, and people coming from different cultures and from different philosophical traditions can and do draw them differently."[6]

Like dualism, dialectics is a way of thinking. A dialectical perspective, however, draws different boundaries around its objects of study. It focuses not on external connections between static elements, but on dynamic processes which connect internal relations. These relations constitute and are constituted by the elements of the "whole" under scrutiny. Ollman and Vernoff write that "dialectics restructures our thinking about reality by replacing the common sense notion of 'thing,' as something which *has* a history and *has* external connections with other things, with notions of 'process,' which *contains* its history and possible futures, and 'relation,' which *contains* as part of what it is its ties with other relations."[7] In this context, dialectics, like dualism, adds nothing to social reality. Dialectics and dualism simply offer different ways of drawing conceptual boundaries.

Dualism draws boundaries based on "external" relations. Non-dualistic or dialectical analysis draws boundaries based on "internal" relations. Both methodologies see relational principles at work; it is the quality of the relation which is in question. Brand Blanshard explains that "a given term is internally related to another if in the absence of the relation it could not be what it is. A term is externally related to another if the relation could equally be present or absent while the term was precisely the same."[8]

Libertarian dualism sees the market as a spontaneous social force which could exist with or without the state—though politically, libertarianism stresses that the market will not develop its full coordinative

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potential unless society dispenses with the externally intrusive state apparatus. A non-dualistic approach, however, sees the market and the state as internally related. Resolution of the contradiction between them is not achieved by the one-dimensional emphasis of either principle, since both spheres are viewed as historically specific to a particular system of social organization.

Libertarian dualism, then, attempts to isolate state and market in a way which conceptualizes their basic hostility. This results from focusing on their animating principles, rather than on their historical interaction. A non-dualistic or dialectical approach attempts to identify state and market in a way which includes both their basic hostility and their organic conjunction. This is achieved by focusing primarily on their interaction in specific historical circumstances, rather than in the realm of abstract principles. Where dualism sees contradiction between the logical principles of two distinct social organizations, dialectics sees contradiction within a structural whole that encompasses both state and market in their historical interpenetration. In addition, dialectics employs an expansive definition of social practices, which seeks to uncover contradiction on many levels of generality. This will become apparent in our brief discussion of Habermas's reconstruction of the Marxian project.

Elements of a non-dualistic approach are evident in the works of both Marxists and non-Marxists. Brand Blanshard has argued that ultimately, any factor that we perceive is "engaged in manifold interactions, by way of attraction and repulsion, with things around it, and these almost certainly determine its shape down to the last detail."[9] From an ontological standpoint, it would seem that "every character counts, but not all characters count equally."[10] For Blanshard, "no thing or individual stands by itself; it is what it is in consequence of lines of determination—causal, logical, or both—running out into an illimitable universe."[11] These lines of determination help us to understand how within a whole, certain factors exert a reciprocal effect.

In terms of sociological inquiry Hayek, too, expresses elements of a philosophy of internal relations. For Hayek, the individual cannot stand by himself—he is invariably an actor in a specific historical and cultural context. Hayek's arguments have an epistemological dimension as well. For Hayek, there is a limit beyond which we are unable to articulate the rules, customs and habits which govern our lives. We are *internal* to these rules and cannot take an external, transcendental role. To this end, even our consciousness operates according to rules of

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which we are not conscious—since these rules are internal to the operation itself.

Socialist Dualism

Marxism, of course, offers another species of internal relations. Indeed, the classic dichotomy in Marxist thought between "base" and "superstructure" is most definitely not a one-way causal model of externally related phenomena. Both the "base" and the "superstructure" are organically inter-related and constitutive of each other, though Marxist materialism has traditionally assigned a greater role to those forces in society which are necessary "in the last instance" to the reproduction of the human species. Yet, despite its philosophy of internal relations, Marxism has seen the development of two divergent approaches to Marx's original propositions. One approach we have already defined as fundamentally "dualistic" and instrumentalist. "Socialist dualism" is the cornerstone of "socialist" practice in the twentieth century. The creation of a "socialist" society on a quasi-feudal material base goes well beyond Marx's understanding of socialist transition. Modern "socialism" approaches the economy as if it were an infinitely malleable substance. Yet state planners remain dependent on the market and state forces which they are unable to transcend.[12] Hence "constructivism," the Hayekian term used to describe the attempt to design social institutions transcendentally, is inherently dualistic since it imposes an externally derived "plan" on spontaneous social forces.[13]

Twentieth-century socialists have gained power before achieving what Gramsci has called a "bloc of historical forces." For Gramsci, as for Marx, the proletarian revolution must attain social maturity before it achieves political power. This "social maturity" must develop out of an advanced capitalist material base. "Hegemony," in Gramsci's works, is a highly dialectical concept since it employs an expansive definition of the state. For Gramsci, the proletarian political victory must be accompanied by a corresponding achievement in the "ideological state apparatuses." These structures are not exclusively state formations. Most of them, in fact, reside in "civil society." The ideological state apparatuses include institutions of religion, education, family, law, communication and culture, as well as political parties and trade unions—all of which are expressive of bourgeois social relations.[14]

The Critical Theorists of the Frankfurt school have taken the argu-

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ments for a reconstituted Marxist dialectic to an even more integrated, non-dualistic level. This "phenomenological" Marxism is the second basic approach to Marxist theory and it is more specifically dialectical—examining social domination on a variety of interconnected analytical levels.[15] Where Gramsci sees bourgeois exploitation in both state and civil society, Habermas, for example, extends the analysis to symbolic interaction. Habermas makes use of Ryle's distinction between "knowing how" to do something and "knowing that" which one does. The former epistemological principle is embodied in human skills, forming the core of what Polanyi has called the "tacit component" of human knowledge. Hence, human beings interact by making statements which employ certain tacitly accepted operations and rules of language. For Habermas, "rational" reconstruction is the basis of radical transformation since it aims to make explicit those tacit components of knowledge. The "ideal speech situation" would assure communication "without domination." By making content explicit, the speaker and the listener become united in a consensual relationship of trust, reciprocity, mutuality, and sincerity.

Habermas's argument attempts to synthesize a host of theoretical concerns. Yet, it grows out of a critical dialogue. First, it reacts against the scientistic, positivistic, and mechanistic conception of reason which divorces facts from values. This is the "instrumentalist" reason identified—and opposed—by the Frankfurt school as a child of war-torn Europe, a conception of reason applied to technique but not to human values, culminating at the gates of Auschwitz and its systematic, carefully planned mass-extermination. Secondly, Habermas's argument reacts against the "atomism" in bourgeois thought and the "economism" in socialist theory. It reinvigorates a critical dialectic firmly rooted in the Marxist tradition.[16]

For Marx, all the aspects of bourgeois society are internally related in their organic and historical movement. Such a "movement" is propelled by social "contradiction." This notion of "contradiction" is *not* a logical construct. Rather, it helps Marx to focus on how polar opposites—like state and civil society—interpenetrate each other, becoming the source of both mutual antagonism *and* mutual support. By contrast, dualism conceptualizes a deep hostility between the state's "coercion" and the market's "voluntarism." Since it focuses on the abstract, it develops a series of "ideal types" which, in a static moment of analysis, helps us to see some of the real constituent principles of certain existing social relations. But, where dualism *over-emphasizes* the *opposition* of ideal principles, it *under-emphasizes* their historical affinity

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and developmental *unity*. Things that appear separate and opposed may reciprocally presuppose each other.

Libertarian Dualism

The discussion in CRITICAL REVIEW of "Green" politics by Gus diZerega (Spring 1987) points to deep dualistic presuppositions in modern liberal thought.[17] A market reflects the atomistic legal structure upon which it is based. Marx claimed, for instance, that bourgeois capitalism gave man freedom *of* religion, but not freedom *from* religion. Man develops the right to free speech without developing a corresponding freedom from distortive and irrational speech which perpetuates social domination. Hence, man's freedom is negative, one-dimensional and alienated. The atomistic view of freedom gives moral sanction to the form without passing value judgments on the content. According to libertarian theorist Murray Rothbard, this is the *strength* of the libertarian project—since the "axiomatic" principle of "non-aggression" does not depend on a New Man, but gives human beings the right to develop in diverse and unique ways. Hence, it does not rely on a hegemonic value structure and can incorporate many different cultural elements.[18] However, if the libertarian must construct a fixed and immutable "axiom" of "non-aggression" to bridge the chasm between "what is" and "what ought to be," he is no better than the socialist who constructs a plan to bridge the gap between "civil society" and "state."

Milton Mueller (Spring 1987) suggests that this is the "political illusion of libertarianism."[19] Where Lenin sought the absorption of the market into the state apparatus, the libertarian seeks to transcend "coercive" politics by absorbing traditional state functions into the market's voluntarist domain. Both solutions are inherently dualistic.

Yet, libertarian analysis can go beyond its dualistic assumptions in certain, limited ways. Rothbard, for example, shows us two widely different views of the nature of "voluntarism" and "coercion." These views vary because Rothbard draws different conceptual boundaries in each instance. His *Power and Market* presents an antagonistic (i.e., dualistic) relationship between the hegemonic state and the voluntaristic market. The state embodies coercion, exploitation, caste conflict, war, and calculational chaos. The market embodies freedom, mutual benefit, mutual harmony, peace and rational economic calculation. The two spheres are irreconcilable and mutually exclusive.[20]

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However, there are times when Rothbard grasps the internal relationship between "voluntarism" and "coercion." He suggests in his introduction to La Boétie's *Discourse of Voluntary Servitude* that "coercion" involves a power relationship based on consent and that ultimately, the state's authority is derived from the "voluntary" sanction of the citizen.[21] From this perspective, we are forced to question the actual "coerciveness" of the state and its institutional forms. In the first instance, a dualistic understanding of "voluntarism" and "coercion" compels us to acknowledge the coerciveness of taxation and conscription. Yet, when the dualistic opposition is not overemphasized, the distinction between the "voluntary" and the "involuntary" is altered, and we are propelled to a deeper psychological and structural understanding of the nature of power itself. Stressing the *internal* relationship between polar opposites allows for a more sophisticated analysis with vastly different theoretical implications. Yet, libertarians typically stress the *external* relationship between hostile spheres of social reality. Their methodological conception paves the way for a dualistic view of state and economy.

The state, argues the libertarian, is a parasite on production. The state's existence would be subverted if it were capable of totally suppressing the market forces that are responsible for its survival. In a sense, the state is an "epiphenomenon" of the market, because it is genetically dependent on production. However, this dependence is one-dimensional and antagonistic; the state stands as an external intrusion on all spontaneous social forces. Its nature is violent and coercive; its purpose is class aggrandizement and enrichment. "Class," in the libertarian view, is external to the market, but internal to the state. It is a political relation rather than a relationship to the means of production. Hence, the libertarian sees systemic distortions strictly in terms of state intervention. "Interventionism" is itself a dualistic concept since it posits the "intervention" of one sphere into the domain of another.

This structure of explanation raises important questions. Randall Kroszner (Spring 1987) writes that the state's involvement in scientific research "illustrates the powerful distortive impact that government can have on the adoption of technology."[22] Kroszner, like most libertarians, makes the "significant distinction" between "laissez-faire capitalism (in which government intervention is minimal) and state capitalism (in which select groups receive special government privileges, subsidies, or protection from competition)."[23] Yet, libertarians have argued that "laissez-faire" never existed, and that government intervention has always been a political reality. Indeed, if the very existence of

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the state constitutes intervention, then libertarians are contrasting differences in degree, not differences in kind. The market continues to exist within the parameters of state involvement—especially a legal structure which defines the very form of property relations. In this important regard, the market may be "reproducing" the "injustices" of statist intervention.

Entrepreneurs have been known to convert the products of military research into consumer goods, a process Rothbard calls the conversion of "force" into "service."[24] Libertarians need to question the nature of this conversion process since the state structurally biases the market in favor of industrial sectors that achieve the conversion first. Are the benefitting industries constitutive of a privileged class, even if they are marketing consumer electronics and not military hardware?

The libertarian makes the state the core of evil in the modern world, and focuses on its elimination as a significant step toward human liberation. Yet, the libertarian tends to under-emphasize the influence of "spontaneously" operative hegemonic principles which infect so many human relationships on a variety of levels. There are relationships of power in the boardroom and the bedroom. But libertarian thought resists grasping the totality of power, focusing instead on a single institution in a single context. Libertarian dualism traces hegemonic principles one-dimensionally; hence, libertarian anarchy becomes a tribute to dualistic resolution. The dualistic polarity between voluntaristic and hegemonic principles of social organization is consistently resolved in terms of the voluntaristic principle. The market absorbs the legal and judicial functions of the governmental apparatus, and in the process, transcends the coercive character of the state.

Libertarian Dialectics

However, if we can modify the distinction between "voluntarism" and "coercion," as Rothbard does in his introduction to La Boétie's work, we are apt to find "coercive" principles at work in "civil society," just as we find "voluntarist" principles at work in our tacit allegiance to the state. The libertarian committed to "non-aggression" must, then, oppose any and all coercive social relationships. Gus diZerega's article implies that this would entail dispensing with the atomistic foundations of the market, approaching, instead, a more relational defense of its principles. Ironically, diZerega claims that Marxism, embodying a highly relational methodology, is itself a child of Newtonian atomism.

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Marxism, in diZerega's view, is unable to propose a fundamental resolution to the dichotomy between nature and the ecological distortions of man's domination of nature. This may be true. But diZerega's view fundamentally obscures the reason for the overwhelming appeal of Marxism to the Greens.

Marx's project is inherently dialectical. That is, it is based on a philosophy of internal relations which sees a mutual interdependence of many factors in contradiction. DiZerega claims that contemporary physics, ecology and feminism have helped to develop a modern understanding of social and natural networks in which "no part . . . can be fully understood in isolation from the rest. Relationships have more reality than boundaries."[25] This is precisely the insight of Marx's method—and Hegel before him—even if we may question their particular applications of dialectical analysis.

Yet, Don Lavoie (Winter 1986–7) writes that Marx's project is a politics for the "end of time" since it posits man's complete mastery of nature and an end to scarcity.[26] Indeed, judging from the Habermasian reconstruction, socialism becomes a politics which is equally dependent on the complete mastery of symbolic interaction. The "tacit" component of human knowledge is no longer implied—it is transcended in the ideal speech situation. Hence, the Habermasian reconstruction strikes at the heart of the Hayekian justification for the market. Hayek sees the market as an institution for the transmission of data and skills, production factors and entrepreneurial "know-how." Michael Polanyi insists that as our definitions become more explicit, and as we articulate rules, we shift "the tacit coefficient of meaning" but "cannot entirely eliminate it."[27] Habermas's ideal speech situation suggests that such a coefficient can be eliminated—leading to the complete victory of human intentionality and the complete elimination of the unintended consequences of human action.

If this seems somewhat fantastic, it is nonetheless an outgrowth of Marx's project. Marx does not envision the dualistic planning mechanisms of modern-day socialism. Ultimately, he predicts the transcendence of all polarities since dualism itself is a product of history. In communist society, there will be no need for state—or market; their inner tension is historically specific to the capitalist mode of production. Both the market and the state wither away, as man stands at the dawn of true human history.

Libertarian thought, by contrast, does not seek an elimination of market institutions since it is less optimistic about man's ability to transcend his present epistemological limitations. Libertarianism con-

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sciously avoids the demand for totality which makes Marxism both attractive and dangerous. Richard Bernstein suggests that Marxism is dangerous if it is utilized to coercively establish a "bloc of historical forces" in the achievement of its goals.[28] The demand for totality may be inherently at odds with libertarianism precisely because the attempted statist "construction" of a totality has been catastrophic. A "constructivist" conception of totality is not a politics for the end of time—it is a politics for the end of humanity. This is why Marx, in order to remain true to his dialectical view, has to see the emergence of communism as a spontaneous, teleological outgrowth of the internal contradictions of capitalist society.[29] He offers no substantive blueprints for the construction of socialism, *on principle*.

The libertarian opposition to totalistic analysis may be expressive of its reliance on a reified "bourgeois" world-view which is organically linked to the mass rise and cultural acceptance of atomistic-dualistic presuppositions in the first place. Libertarian dualism has the effect of separating the principle of "freedom" from the cultural and historical context upon which it must build and upon which it genetically depends. Social change does not occur in a vacuous "state of nature." A politics for the "end of time" and a politics for the "beginning of time" are equally utopian. If libertarianism moves in the direction of contextual, relational, dialectical, totalistic analysis, it may face a necessary crisis which severs it from its essential dualism—and its political project. This theoretical tension demands resolution.

NOTES

1. The Disneyland metaphor is not entirely tongue-in-cheek since libertarian theory proposes the privatization of so-called "collective" goods, most of which may be provided by "tying" them to the provision of private goods. Disneyland does, in fact, provide for its own sanitation and security. For an excellent critique of public goods theory see Tyler Cowen, "Public Goods Definitions and Their Institutional Context: A Critique of Public Goods Theory," *Review of Social Economy* 43, no. 1 (April 1985): 53–63.
2. The phrase is used by Geoffrey Hellman, "Historical Materialism," in John Mepham and David-Hillel Ruben, eds., *Issues in Marxist Philosophy: Materialism* (Atlantic Highlands, N.J.: Humanities Press, 1979), 161.
3. Sidney Hook, *From Hegel to Marx: Studies in the Intellectual Development of Karl Marx* (New York: Regnal and Hitchcock, 1950), 62.
4. Wolf Heydebrand maintains that "ontological dualism posits the dichotomy of matter and mind, moral and religious dualism the radical sepa-

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rateness of good and evil, epistemological dualism that of the real object and the datum immediately present to the knowing mind." Wolf V. Heydebrand, "Marxist Structuralism," in Peter Blau and Robert Mertan, eds., *Continuities in Structural Inquiry* (London: Sage Publications, 1981), 92. This whole dimension of methodology was first brought to my attention by Professor Heydebrand. Heydebrand maintains that dualism pervades Western philosophy. Its presence may even be detected in Marxist structuralism, and in aspects of Habermas's thought. Habermas writes of the dualistic conflicts between the "life-world" in which "praxis" operates, and the political needs of administration expressed in the state. See the essay by Heydebrand and Burris on "The Limits of Praxis in Critical Theory" in Judith Marcus and Zoltan Tar, eds., *Foundations of the Frankfurt School of Social Research* (New Brunswick: Transaction Books, 1984), 401–417.

5. David Kelley, *The Evidence of the Senses: A Realist Theory of Perception* (Baton Rouge: Louisiana State University Press, 1986), 81.
6. Bertell Ollman and Edward Vernoff, eds., *The Left Academy: Marxist Scholarship on American Campuses,* vol. 3 (New York: Praeger, 1986), xiii.
7. *Ibid.*
8. Brand Blanshard, *Reason and Analysis* (La Salle, Ill.: Open Court Publishing, 1962), 475.
9. *Ibid.*, 481.
10. *Ibid.*, 482.
11. *Ibid.*, 485.
12. Don Lavoie, "Political and Economic Illusions of Socialism," CRITICAL REVIEW 1, no. 1 (Winter 1986–7): 1–35.
13. There are however, certain dualistic elements in the Hayekian schema involving the distinction between "spontaneous order" and "constructivism." Yet Hayek's more "holistic" methodology enables him to go beyond such atomistic constraints. See John Gray, *Hayek On Liberty* (New York: Basil Blackwell, 1984) for a fine introduction to Hayek's thought.
14. See Antonio Gramsci, *Selections from the Prison Notebooks,* ed. and trans. Quentin Hoare and Geoffrey Howell Smith (New York: International Publishers, 1971). See also Chantal Mouffe, ed., *Gramsci and Marxist Theory* (London: Routledge and Kegan Paul, 1979).
15. See Martin Jay, *The Dialectical Imagination* (Boston: Little, Brown and Company, 1973), for a fine overview of the history of the Frankfurt School.
16. Habermas's thought is neatly summarized in Thomas McCarthy, *The Critical Theory of Jürgen Habermas* (London: Hutchinson & Co., 1978).
17. Gus diZerega, "Green Politics and Post-Modern Liberalism," CRITICAL REVIEW 1, no. 2 (Spring 1987): 17–41.
18. Murray N. Rothbard, "Is Liberty Enough?" *Reason* 11, no. 8 (December 1979): 58.
19. Milton Mueller, "Lost Illusions," CRITICAL REVIEW 1, no. 2 (Spring 1987): 75.

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20. Murray N. Rothbard, *Power and Market: Government and the Economy* (Kansas City: Sheed, Andrews and McMeel, 1977), 263.
21. Murray N. Rothbard, "The Political Thought of Étienne de la Boétie," introduction to *The Politics of Obedience: The Discourse of Voluntary Servitude* (New York: Free Life Editions, 1975), 9–42.
22. Randall Kroszner, "Technology and the Control of Labor," CRITICAL REVIEW 1, no. 2 (Spring 1987): 7.
23. *Ibid.*, 11.
24. Rothbard, *Power and Market,* 132–135.
25. DiZerega, 23.
26. Lavoie, 28–29.
27. Michael Polanyi, *Personal Knowledge: Towards a Post-Critical Philosophy* (Chicago: University of Chicago Press, 1962), 250.
28. The "bloc of historical forces" is Gramsci's phrase. On the Marxian demand for totality, see Richard J. Bernstein, *Praxis and Action: Contemporary Philosophies of Human Activity* (Philadelphia: University of Pennsylvania Press, 1971), 160, 309.
29. For an excellent interpretation of Marx's teleological and essentialist arguments, see Scott Meikle, *Essentialism in the Thought of Karl Marx* (LaSalle, Ill.: Open Court Publishing, 1985).

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RESEARCH

Christopher Phelan

A DEFENSE OF RATIONAL EXPECTATIONS / GENERAL EQUILIBRIUM ANALYSIS AGAINST AUSTRIAN OBJECTIONS

During the past fifteen years it has become common in macroeconomics to use mathematical representations of hypothetical worlds as a means for inquiry and debate. Often such representations (usually referred to as "formal models") bear little resemblance to our own world. Supporters of the Austrian school of economics often assert that such "mainstream" economics, especially a form known as rational expectations general equilibrium analysis, is absurd. David L. Prychitko (CRITICAL REVIEW, Summer 1987) portrays such theoretical economists as would-be physicists obsessed and fascinated only with mathematical puzzle solving. Kurt Schuler (CRITICAL REVIEW, Winter 1986–7) claims Austrian objections to equilibrium modeling are "so elementary that one would think they would be at least widely argued, even if not accepted," but are ignored simply because they represent too radical a challenge to the status quo. In fact, many Austrian objections to equilibrium modeling, far from being such damaging blows that Austrians should feel confident engaging in ridicule, are the result of misunderstandings concerning the concept of equilibrium used in modern economic models and the purposes for which these models are presented.

Equilibrium

The most common of these misunderstandings is the view that economic equilibrium is a concept representing the coming to rest of a system over time.

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This view leads to the argument that since the real world is obviously not at rest, equilibrium modeling is an inappropriate means by which to describe or attempt to explain it. To understand the way mainstream economists actually use the concept of equilibrium, however, consider the following example first suggested by Harold Hotelling.[1]

Suppose each of two hot dog vendors on a thin beach wanted to set up his stand so as to maximize the amount of beach to which his stand was the closest. If the position of one of the vendors was fixed we could deduce the best place for the other to locate, but without this assumption we have a problem of interdependency. Clearly, where the first vendor should put his stand will depend on where the second vendor puts his and likewise for the second. Nevertheless, we would like to have some way of separating likely from unlikely outcomes. To handle this interdependency we look for placements such that given the position of the other vendor, neither vendor has an incentive to move. We label such points equilibria. The justification of singling out such situations is the common-sense assertion that we should not expect to observe people in situations where they could make themselves better off by unilaterally changing their actions.

A quick thought experiment should confirm that the only equilibrium in this game is for both vendors to locate as close as possible to each other at the midpoint of the beach with each serving the half of the beach closest to him. Given any other placement, one of the vendors could move and increase his share of the beach. This equilibrium, like all modern economic equilibrium concepts, does not represent a situation where things come to rest over time, but where minds or strategies are "at rest" with respect to each other. In fact, we did not mention time at all.

The value of such an exercise is that strong insights are gained into such puzzling phenomena as why all the gas stations in town are at the same intersection or why major political parties seem to occupy the center of the political spectrum. The use of such examples (or "models") is similar to a painter purposely abstracting from reality in order to direct the eye to a particular aspect of it. It is the hope of the artist or model builder that after viewing the abstraction, the real world will be seen differently. Using similar tools, it is hoped that general equilibrium theory and dynamic rational expectations models can help explain a broader range of economic phenomena than otherwise would be possible.

General Equilibrium

The goal of general equilibrium modeling is to specify the underlying characteristics of an entire hypothetical economy and from this infer the behaviors of participants in it, much in the same we specified the physical structure of the

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beach and the goals of the hot dog vendors in order to infer their behaviors. By "underlying characteristics" we mean some representation of preferences such that given any two outcomes we know which one each person would prefer, the means available to each person of transforming some goods into other goods, and how much of each good (including his own time) each person initially owns.

Given these, there exist many possible physically attainable outcomes in terms of production and consumption and, like the above model, interdependencies concerning what a given agent should do given the actions of the others and his own preferences. One way to separate likely from unlikely outcomes is to assume each person sees himself as able to trade goods and labor at market prices which he cannot affect. Each person's decision then consists of how much of each good to buy or sell at these prices. We can then define an equilibrium as a set of prices for every good in the economy (including wages for each grade of labor) and a set of physically attainable consumption and labor decisions for each agent in the economy such that no agent can make himself better off unilaterally choosing a different affordable consumption and work combination.

Once again it is important to note that equilibrium is in terms of minds at rest and not in terms of variables such as prices or quantities settling down over time. In fact, again we have not even considered time in our model. Nevertheless, such an exercise provides great insight into how actual economic outcomes are determined. In effect, the model builder shows exactly why the given phenomenon occurs in his hypothetical economy and leaves the viewer to draw the appropriate analogy to the real one.

Time

The key to extending the above model to one involving time, in the hope of gaining insight into a richer class of phenomena, is recognizing that just as apples and oranges are considered distinct goods each with its own price, apples today and apples tomorrow (or any future date) also can be considered distinct goods with distinct prices. This allows the consideration of choices concerning goods existing at different times to be included without changing the basic model. Whereas we previously considered preferences to regard bundles of goods and labor existing at the same time, now preferences are considered to be in regard to entire paths of consumption of each good and labor over time. An equilibrium is then a set of physically attainable consumption and labor decisions over all goods and all dates for each person such that he is choosing his most preferred affordable path. In general, such an equilibrium would not have the same characteristics at each date and thus can be used to model a world that varies over time.

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Expectations

The above model assumes the existence of a market involving the trading of goods existing at future dates. That is, we assume individuals trade enforceable contracts specifying the delivery of a given good or unit of labor at a given date for every good in the economy and every future date, and that all decisions and trades concerning these contracts occur on the first date. The future then only consists of agents carrying out what they already had agreed to do. It is at the initial date that consumers are considered to weigh alternative lifetime paths.

To the model builder this extension is quite attractive. We simply treat the differences between present and future goods as we treat those between apples and oranges, enabling us to use the same tools already developed for consideration of models where time is not explicitly considered. Nevertheless, this is obviously a huge abstraction from reality since individuals clearly make decisions throughout their lives, and one must question the validity of any model that assumes this fact away. For this reason, economists developed models where individuals decide at each date how much to consume, work, save or borrow for only that date. Future decisions are left for the future.

This type of model requires the model builder to introduce expectations since, in general, how much an individual will choose to save or borrow today will depend on his expectations concerning future prices. A once popular method of proceeding was for the model builder to give the individuals in the model an intuitive or reasonable rule for determining expectations. Examples of such rules are individuals believing future prices will be the same as present prices, or that in the future, prices will move at the same rate as they have currently been moving. Taking these rules as given, one can then sequentially get equilibria for each time period.

In addition to those two examples of "reasonable" rules for forming expectations many more exist. Which of these rules are chosen dramatically affects the outcome of the model. The expectations of future prices the model builder gives to the model's inhabitants will determine what those future prices will be. This leaves the model builder with the dilemma of how to choose expectations.

The "rational expectations" approach is to consider expectations (or the rule for determining them) not as an initial choice of the model builder, but as an outcome of the model like consumption levels or prices. Since we have an interdependency between future prices and the expectations of those prices, we handle this in the same equilibrating way we handle other interdependencies.

In the hot dog example, an equilibrium was a situation where the position each player chose was the one he should have chosen given the action of the other vendor. Similarly, we can define a rational expectations equilibrium as a set of expectations over future prices along with decisions regarding saving,

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work, and consumption such that for each person, what that person decided and expected is what he or she should have decided and expected given the information available to him or her at the time and the decisions and expectations of the others.

An important result is that a rational expectations equilibrium in this model corresponds to an equilibrium in the earlier world where all decisions and trades occured on the first date, and that it results in the same actual consumption and labor outcomes. This is neither obvious nor trivial. In effect, the more difficult but realistic model justifies the use of the more simple but abstract one. For this reason, use of the simpler model has become more popular.

Both result in the same outcome because in the world where the only uncertainty corresponds to the behaviors of the other individuals, the only rational expectations equilibrium is for each person to perfectly predict the future. Although this may seem outrageous, this is the same as when each hot dog vendor correctly expects the other to locate in the center of the beach. The lack of realism comes from not allowing for underlying uncertainty in the world. Nevertheless, such models go a long way toward explaining phenomena such as inflation or interest rates.

Uncertainty

In models that must deal with underlying uncertainty we can use the same strategy as above. First, just as we considered apples today and apples tomorrow as distinct goods with distinct prices, we can consider apples tomorrow if it rains and apples tomorrow if it doesn't rain as distinct goods with distinct prices. Whereas before, we considered people's preferences to be regarding paths of consumption and labor over time, now we consider individuals comparing paths where consumption and labor are defined over each possible future. An equilibrium is then defined as a set of prices and consumption and labor decisions over all dates and all possible states of the world at those dates such that no one can make himself better off *ex ante* by choosing a different affordable strategy. That is, although each person will in retrospect regret ever having prepared for contingencies that never occurred, no one could have expected to have done any better by making different decisions.

Once again, such a strategy is attractive to the model builder because it involves using exactly the same analysis as models where neither time nor uncertainly are considered, but unfortunately it has even worse problems with realism. We now implicitly assume that there exists a market at the first date consisting of the trading of enforceable futures contracts for each good not only for each future date but also for each possible state of the world at that date, and that individuals make explicit decisions at the first date for every conceivable outcome of whatever underlying uncertainty exists in the econ-

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omy. The future then consists only of carrying out the plans corresponding to the actual realizations of the uncertain events.

As before this can be justified as having the same outcome as a world where decisions are made throughout life and where expectations are rational. In such a model, current decisions will depend on beliefs concerning the future, but the future will be affected by current decisions, and thus we define an equivalent rational expectations equilibrium in which the only difference is that beliefs concerning the future must be such that no one *could have expected at the time* to have done any better by changing his strategy or beliefs concerning the future.

Unlike models without underlying uncertainty, here individuals do not perfectly predict the future. Expectations are merely as good as possible given the information each individual has and the actions and expectations of the other individuals. This is enough, however, to guarantee that any rational expectations equilibrium will correspond to an equivalent equilibrium in the simpler model where all decisions are made at day one.

Applications

Although such models can unfortunately require the use of difficult mathematics to formalize or even understand, they have been quite illuminating in a variety of important applications. Robert Lucas gives compelling examples of how unexpected changes in the supply of money can have real effects on output and consumption and why in countries with past histories of monetary instability, monetary policy is less influential.[2] Sanford Grossman formalizes an idea of Hayek's and shows precisely how in a society with diffuse information, rational expectations equilibrium prices carry all the necessary information to achieve the same outcome as an equivalent society where all information is known by everyone.[3] Other applications have included analyses of deficit spending,[4] the demonstration of how large econometric models of actual economies can at the same time be quite successful at short term prediction but useless as means of evaluating alternative policy rules,[5] and an argument that eliminating cycles of recessions and booms may not be desirable.[6] Although each of these applications considers abstract hypothetical worlds, in each case the reader sees in the abstraction a previously hidden characteristic of the real economy.

Austrian Objections to Rational Expectations

Austrian objections tend to center on the validity of equilibrium and the use of formal models altogether. Regarding equilibrium, objections other than the confusion over what is "at rest" mainly deal with the role of learning or mistake-making in the analysis of human behavior.

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Rational expectations models deal with people who act optimally with respect to their preferences and circumstances at all times. For many applications these circumstances can be designed to model learning. In an uncertainty model each person "learns" the outcome of previously uncertain events at each time period. Furthermore, one can conceive of examples where information is hidden unless individuals take costly actions to acquire it and thus "learn," but in which they still do so in an optimal manner. Austrians would contend that such models ignore "true" learning because true learning also involves learning how to play the game correctly. Since they consider it obvious that in the real world people make "true" errors (errors that could and should have been avoided given the available information and circumstances), examples that assume this away are useless and trivial.

In effect, an economist's opinion on this question will determine his opinion on formal modeling, since, for the most part, one cannot thus reject equilibrium without abandoning formal modeling. For a model builder, equilibrium provides a way of separating outcomes into the likely or intuitive and the unlikely or counter-intuitive. If one abandons this, how does one choose among alternative stupid behaviors and justify the choice? Any rule the economist chooses will assert an underlying cause of the mistake and thus beg the question of why this cause cannot be modeled as an underlying circumstance.

Austrian Objections to Formal Modeling

Austrian objections to formal modeling consist chiefly in questioning the validity of using models with "unrealistic" assumptions, and the supposed inability of mathematical models to capture the "subjective" nature of human behavior. It is common for formal models to consider worlds with identical individuals, individuals who live forever or for only one date, and worlds where everything is certain or at least all uncertainty is in the form of universally known probabilities of future events. The purpose of the such exercises is to consider worlds simpler than our own so that precise conclusions can be drawn for the hypothetical worlds, while maintaining enough similarity that a useful analogy to reality can be drawn. Models are never meant to be exact descriptions of how actual phenomena occur. Instead, the model builder sweeps away the complications of the real world and draws the eye to only one selected aspect of it that otherwise may have remained hidden. To require models to be "realistic" is to defeat the entire purpose of modeling.

This applies to both mathematical and verbal examples. After winning the Nobel Prize in Economic Science, James Buchanan was criticized because his "simplistic" verbal models of the political system considered only completely self-interested politicians, with no role for ideology or altruistic intentions. Fortunately, the Nobel committee saw that although the real world definitely does not consist of only self-interested, non-ideological politicians, the consideration of a world that does sheds important light since such a world operates

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remarkably like our own. Since his purpose was to show the role of self-interest in politics, considering ideology would only have filled Buchanan's argument with useless and obscuring clutter. Likewise, when Lucas considered a world where uncertainty was modeled "unrealistically," this simplification allowed precise formulations of a rational expectations equilibrium which allows great insight as to why monetary policy can cause recessions and booms.[7]

Austrian Subjectivism

Austrians contend that the most important flaw of formal models is their supposed inability to handle the "subjective" nature of human interaction. Prychitko voices a typical complaint when he writes that neoclassical theory treats human agency and interaction "as if they were part of a mechanical rather than a social process. Agents do not choose, they react to various prices and incomes; they do not actively create plans for an uncertain future, but instead move according to some 'well behaved' function: indifference analysis and Lagrangian multipliers replace human agency." Such treatment is alleged to purge intention and will from economics.[8]

Such criticism questions the basic tenet justifying all social science: that like all other observed phenomena, human behavior is caused. Any behavior at all can be explained by asserting that the various actors "willed" to act the way they did. What is important is causes behind these choices. To assert that humans are so different from the rest of the world that tools developed for tracing complex cause-and-effect relationships are inapplicable is to give up hope of understanding human behavior and demote the social scientist to the role of simply observing what might as well be supernatural phenomena.

This unfounded distrust of formal abstraction hinders Austrians from accepting arguments that support their beliefs and reduces their influence in the field. In both micro- and macro-economics, formal models have provided insight in important areas of individual and social behavior. Rational expectations general equilibrium analysis represents not the fantastic play of mathematicians but a successful and promising reach of economic tools already shown useful in analyzing human action.

NOTES

1. H. Hotelling, "Stability in Competition," *Economic Journal* 39, no. 153 (March 1929): 41–53.
2. R. E. Lucas, Jr., "Expectations and the Neutrality of Money," *Journal of Economic Theory* 4, no. 2 (April 1972): 103–124.
3. S. Grossman, "An Introduction to the Theory of Rational Expectations Under Asymmetric Information," *Review of Economic Studies*, 48(4), no. 154 (October 1981): 541–60.

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4. R. S. Barro, "Are Government Bonds Net Wealth?", *Journal of Political Economy* 82, no. 6 (November/December 1974): 1095–1117.
5. R. E. Lucas, Jr., "Econometric Policy Evaluation: A Critique," in *The Phillips Curve and Labor Markets,* ed. Karl Brunner and Allen H. Meltzer (Amsterdam: North Holland Publishing Co., 1976).
6. F. E. Kydland and E. C. Prescott, "Time to Build and Aggregate Fluctuations," *Econometrica* 50, no. 6 (December 1982).
7. Lucas, "Expectations and the Neutrality of Money."
8. David L. Prychitko, "Ludwig Lachmann and the Farther Reaches of Austrian Economics," CRITICAL REVIEW 1, no. 3 (Summer 1987): 70.

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LETTER

Religion and Post-Modern Liberalism

TO THE EDITOR:

Gus diZerega's article "Green Politics and Post-Modern Liberalism" (Spring 1987) invokes the prestige of a pantheon of modern physicists—Einstein, Schroedinger, Heisenberg, DeBroglie, Pauli, Planck, Jeans and Bohm—to buttress the notion that religion somehow mirrors fundamental physical reality. In particular, the author feels these physicists would all endorse Eddington's view that "the new conception of the physical universe puts me in a position to defend religion against a particular charge, viz. the charge of being incompatible with physical science." The author sees a rapprochement between religious mysticism and "the ultimate spiritual nature of the world" gradually evolving from contemporary physics.

Perhaps the most pertinent point to make in this context is that whatever physics achieves and whatever view of the universe may ultimately evolve from its insights, the fundamental methods and strengths of physics are necessarily opposed to the religious world view. Physics and religion are incompatible at the most basic level.

I cannot think of a time when supporters of religion proposed any physical event whose observation would disprove any religious hypothesis. Data and observation tend to be mere inconveniences to be explained away; the fundamental truths have already been decided.

In physics, though Newtonian mechanics can apparently explain all motion from the fall of an apple to the path of the heavenly bodies, though eclipses can be predicted to split-second accuracy, though Newton's law of gravitation can reign supreme for several hundred years, yet if one new fact such as the bending of light as it grazes the sun is better explained by another physical formulation, we see Einsteinian relativity replacing Newtonian mechanics. One new fact has altered our world view.

In physics the individual datum, the confirmed observation, always has first priority. A physicist may have the soul of a priest. He may have a mystical view of the universe. He may even arrive at his hypotheses through mystical insights. Nevertheless, unless his theoretic formulations are supported by direct physical observation, by the lowly datum that religion so often despises, they will never become an accepted part of physics.

In the datum lies the strength of physics, the strength that religion would seize for its own while rejecting the very methods without which physical achievement is impossible. Physics can achieve because its hypotheses can be wrong; because something in the real observable world can bear upon the truth or falsity of the hypotheses.

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Religion is impotent because it is always right. It is right prior to data and independent of measurement. That which cannot be proven wrong even in principle cannot be relevant or meaningful. Everything in the physical world would occur just the same whether or not the religious insight were true—otherwise, of course, religious insights would be testable.

All of this should serve as a warning to those who would use physics to support religion. Religious thinkers are often attracted to those physical world views that seem to legitimize religion and highly uncomfortable with those that do not. Religion, for example, welcomes a "big bang" theory of creation over a steady-state model of the universe because the former accords better with a prior conception of a time of creation and an independent creator. Religion frowns upon a never-ending self-sustaining cycle of compressions and re-expansions of the universe. It dislikes a model of a universe enduring forwards and backwards into infinity and not requiring a beginning or an end or a creator or a purpose.

Religionists welcome the present direction of quantum physics and those explanations which invoke the primacy of mind and its possible necessity for sustaining and even creating physical reality. They are overjoyed by the various cosmologic anthropic principles being entertained by modern physics. Will they be equally happy if physics takes another twist away from these interpretations? Remember that Einstein, whom the author invokes along with other physicists as a would-be defender of religion against the charge of incompatibility with modern science, himself vehemently opposed such quantum "weirdness" phenomena as representative of fundamental physical reality. Much more may be said in this vein, but the point is clear. Physics cannot be invoked to legitimize religion.

Neither should physics be invoked in support of new paradigms for buttressing libertarian constructs. Libertarianism does not need such support. The search for a fundamental set of moral axioms upon which to build a libertarian superstructure is illusory. Neither physics nor philosophy can offer a foundation.

If, as has been argued by some, the fundamental libertarian insight is that initiation of force and fraud is wrong, then this principle needs no prior moral premise. A libertarian need not defend these principles of human interaction nor need he prove them. He should simply assert them and live by them. No simpler premises are to be found.

A libertarian must have the courage to accept non-provable principles when the concept of proof is itself meaningless. In an axiom system, any theorem, any provable statement is in a sense an unnecessary statement. It is implied by and derivable from the premises, and as in a mathematical structure, it can be replaced by these premises in any further reasoning. If all statements were provable, all would be unnecessary! The very meaning of an axiom is that of an assertion so fundamental as to be underivable from other premises. It is to be asserted and accepted, not proven. We must not flinch from the recognition that an axiom is indeed axiomatic.

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Prof. diZerega has much of value to say about the interaction of libertarian theory with ecological necessity. For example, his extension of the Hayekian concept of spontaneous ordering to the ecological arena is a valid one. So too is his recognition that a "prima facie case exists against any action which diminishes the variety of life on earth as a whole."

The author further points out, correctly I feel, that proper human interaction, the relational aspect of human existence, must ultimately justify, legitimize and even define individual property rights. Thus the ecological consequences of one's actions—their capacity, if you will, to coerce and do harm—becomes a major determinant of their morality.

However, the author dilutes the force of his insights when he attempts to buttress them by appeals to the achievements of physics or by casting them in the mold of new paradigms. They need no such support. His analysis is "simply" (and that should be a term of pride) an investigation into what does and does not constitute initiation of force in one particularly difficult arena.

Mordecai Schwartz, M.D.
Woodmere, N.Y.

GUS DIZEREGA *replies:*

Dr. Schwartz raises a number of interesting points in his letter, presenting a clear and vigorous statement of the view, common among libertarians, that on balance religion has had a pernicious influence upon the quality of human life. I do not share this judgment.

His most basic objection is that the methods of science and religion are opposed. Whereas science always subordinates itself to the sovereignty of observed facts, especially those which are quantifiable, religion is hostile to such facts, or at best distrustful, since it already has the complete truth irrespective of the data. Certainly some religious advocates, such as so-called "creation scientists," fit Dr. Schwartz's characterization. But to consider such obfuscators as typical of the spiritual perspective is to do battle with the flimsiest of straw men.

Dr. Schwartz appears to focus upon only the mainstream Western monotheistic traditions, all of which are based upon sacred Scriptures claiming in some sense to be the revealed word of God. Since these texts make a number of claims about the origin of the world (Genesis) and of various historical events (a world-wide flood), a serious problem confronts those arguing for Scriptures' literal truth when all evidence suggests they are literally mistaken.

But even in the West, and to a large extent outside it, fundamentalist literalism is not characteristic of religious practice or doctrine. Indeed, the most recent revival of Christian fundamentalism goes back only to 1909. Throughout most Christian and Jewish practice (I am less certain of Islam) there are literal, metaphysical, mystical, and analogical meanings to textual interpretation, all of which are considered valid in their place.

In addition, in the West, as well as outside it, alternative religious traditions have their roots in experience rather than authoritative revelation. Spiritual

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teachers help others attain and understand such experiences. Various exercises and practices are advocated which, it is claimed, will in time lead to spiritual insight if pursued diligently. Other practices bring spirits and deities into closer contact with their followers. What should be thought-provoking for those of Dr. Schwartz's persuasion is that in these traditions the ultimate authority is not someone else's experience as it was transmitted in writing, but rather the practitioner's own experience of contact with the divine.

This experiential spiritual tradition is not the scientific method as Dr. Schwartz describes it. But neither is it hostile to science. Both are rooted in experience but *to the extent that genuine spiritual phenomena exist, their comprehension cannot be encompassed within the scientific framework.*[1]

Science is rooted in our capacity to measure and predict. It is therefore significant that human consciousness is neither fully measureable nor fully predictable. It is also significant that when attempting to study human beings scientists usually resort to double-blind procedures. If super-human entities exist they will be even less amenable to scientific methods of study than are human beings themselves. This observation is no criticism of science, but it casts a long shadow over those beguiled by empty scientistic claims of ultimately being able (in principle) to predict and control everything.

The tension between science and religion is different from that described by Dr. Schwartz. Within the Newtonian paradigm matter was considered to be ultimately atomistic and irreducible to non-matter. It was fully governed by deterministic law. Consciousness could not be derived from such stuff and so was an unnecessary element in any scientific explanation.

The only type of religious tradition which seemed in harmony with this view was one wherein an utterly transcendent deity (Newton's clockmaker) created a world of matter completely separate from Him/Her/It/self. But in the absence of new revelation the only certain evidence for such a deity lay in sacred texts. Hence Darwin's crucial impact, for his theory went against a central aspect of a literal interpretation of Scripture. To my mind, after Darwin a deep gulf emerged between science and the most authoritative foundation for the type of religion most compatible with a Newtonian universe.

Twentieth-century theoretical physics has overthrown the mechanistic world view and established in its place one in which matter is only an aspect of energy and in which, according to many physicists, consciousness appears to be a necessary aspect of reality as well. Spiritual phenomena do not appear an alien intrusion in this world to the extent they did in the mechanistic one. This does not mean that physics can be invoked to prove the existence of a spiritual world, but the "new physics" does describe a world wherein spiritual phenomena not only could exist, they could pervade it completely. In this more limited context it is thought-provoking (or should be) that virtually all the greatest physicists believed in the reality of a spiritual world though they also argued that physics could not prove the validity of religion.

These developments in physics should give pause to the committed atheist. It seems to me that a person cannot now rationally reject the existence of a spiri-

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tual reality without at least conscientiously trying some of the practices which supposedly open up one's perceptions to the sacred dimension of the world. Otherwise atheists are (to turn the tables) in the position of the priests who refused to look through Galileo's telescope because they knew a priori that he was wrong.

Nothing here suggests that any particular religious perspective is the best. There are myriad spiritual paths and practices. Those who write about their experience of spiritual matters will do so in terms of their times and their own personal experiences and biases. Those who write about others' writings will be yet another step removed with yet another layer of interpretation added. While mystics of many paths often have much in common, theologians are often more concerned with differences. In addition, given the importance of the subject, it is no surprise that believers usually adhere tightly to their own understanding and rarely take the time to try to understand others' views. There are many parallels to this state of affairs in the scientific community when experimental results are ambiguous and the data can be interpreted in different ways.

I want to touch on one last matter: the intellectual foundations of a good society. Thus far I have tried to argue within Dr. Schwartz's basic presuppositions, but at this point I must abandon them.

When discussing religion, Dr. Schwartz claims that what cannot be proven is neither relevant nor meaningful. But he then invokes the—for him unprovable—axiom of non-aggression as the foundation for libertarian thought: that initiating force or fraud is always wrong. Which to me says that he regards the foundations for libertarian thought as being ultimately irrelevant or meaningless. As existential choices go, Dr. Schwartz has made a good one. But matters are not so bleak.

If I have identified it correctly, the core of Dr. Schwartz's problem is that he accepts the old distinction drawn between facts and values. I do not. I do not want to argue here as to the ultimately spiritual foundation to both. For myself, that realization is experientially grounded and I do not know how to prove it to those who have not experienced it. And those who have experienced it do not need to see it proven. But a number of paths have been proposed towards reintegrating value into the world which carry us far from the old fact/value distinction yet without explicitly confronting the matter of spirituality.

In my view, among contemporary writers Charles Taylor, Alan Gewirth, Hanna Pitkin, and Jürgen Habermas have all done good work at bridging the fact/value gap. Habermas, for example, grounds his argument for the intrinsic and superior value of non-violent relations among people in the character of language and the internal logic of speech.[2] Habermas argues that the inner logic of speech relations presupposes the standard of the "ideal speech relation" which is one of communication among equals without fraud, deceit, or force of any kind. (The standard does not necessarily have the egalitarian implications Habermas gives it, but that is another story.) A similar argument may be

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built from Aristotle's argument about "Man" being a political animal because of the faculty of speech. Ideal politics, for Aristotle, was where people met as equals and reached uncoerced agreement as to what would be good for them as a community. In language the standard of uncoerced speech relationships is a no more arbitrary standard than is the concept of physical health among human beings. Both standards are intrinsic to entities characterized by the power of speech and by being embodied.

We might go further. If those physicists are correct who argue that quantum mechanics requires at least a human level of consciousness to exist, then this value of uncoerced relationships would appear to be intrinsic not just to human beings, but also to the universe itself. Which is about as grounded as a value can get!

I hope that I have covered the major objections Dr. Schwartz raised to my article. When I wrote it I only briefly alluded to the issues discussed here because I felt they would take me too far astray. Now I am not so sure, and so am grateful for the opportunity to address them.

NOTES

1. I will interject, but not here elaborate, that the scientific method itself does not really consist of a simple reliance upon confirmed observations of individual data. For example, the theory of evolution does not fit this model. The interested reader might want to take a look at Philip Kitcher's excellent *Abusing Science* (Cambridge, MIT Press 1982), which is also perhaps the best available attack upon "creation science."
2. See his *Communication and the Evolution of Society* (Boston: Beacon Press, 1979), ch. 1, or the more accessible discussion in Thomas McCarthy's *The Critical Theory of Jürgen Habermas* (Cambridge: MIT Press, 1978), 272–357.

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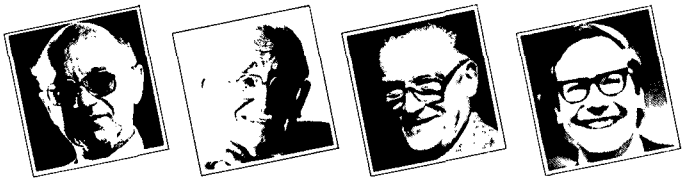

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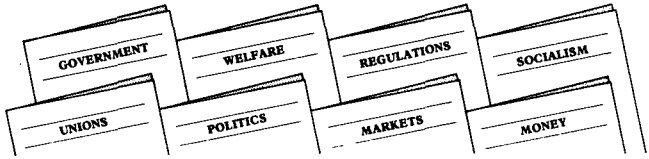

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